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Volume 1 Issue 9 June 1984 UK price 85p

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# COMMODORE

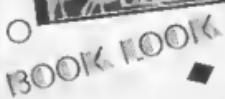
## VIC 20

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Publisher	Annabel Hani
Managing Editor	
Editor	Dennis Jarrett
Features Editor	Karl Dallas
Special Correspondents	Bobdan Bocak
Editorial Assistant	
Circulation Manager	Jim Butterfield
Subscriptions Manager	Chris Durham
Production Manager	Jim Grubbs
Art	Tony Harrington
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Advertising	Mike Todd
Deals for Readers	Nicky Chapman
	Hywel David
	Janet Crawford
	Paul Hulme
	Maggie Underwood
	Mike Pasanden
	Roland Richardson
	Nicky Ned
	Vicki Staples

Editorial	01-241 2448
Advertising	01-241 2417
Production	01-241 2493
Administration	01-241 2354
Subscriptions	Back Issues
	(See last page) 0732 351216

Publisher's guarantee There are no mistakes in this magazine except this one.



### News

What's news to us is probably news to you, and this time we've got our hands on Commodore's brand new modem for the 64 among other things!

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### Shaw time again

The world's premier Commodore-only exhibition runs from 7-9 June in London and we'll be there in force. The exhibitors will have the latest games, the latest add-ons, the newest business software for all the Commodore computers. There'll be Commodore itself, of course, with its new machines (and some good 64 stuff too) and there'll be sidescrolls like the racemaze from Radio Luxembourg. As a preview and taster here's a run-down on the goodness you can see at the Fifth International Commodore Show.

6

### Aaaargh!!! The errors of your ways

The Vic and 64 are quick to highlight your mistakes by flashing a veritable host of error messages on to the screen... but that doesn't guarantee you finding out where you've gone wrong. Here's a practical guide to what the computer might tell you, in the shape of an alphabetical list of error messages: what they mean... and what you might be able to do about them.

27

### Screen scene for Vic

Happy, new games for the Vic keep on truckin' on. Here's our review panel a regular and highly critical look at yet another batch of newcomers.

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### Vic virtuals

Another batch of program-fodder for your Vic.

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### Butterfield on 64 video - part 6

This time, Jim plunges into more advanced and technical waters: split screens on the 64. Has to be seen to be believed, and makes full use of what he's already taught us in previous issues. Can you beat a better intro to the 64's ways with displays? No you can't.

41

### Machine-code packages for Vic and 64: three head-to-head reviews

When you've mastered Basic, your next stride should inevitably be towards machine-code programming - run faster, use more of the computer's facilities. And to help you there are plenty of ready-to-go packages around to choose from. David Bolton indicates what you should be looking for from each producer and assembles three of them for inspection. User-friendly 8802 for Vic Mikes for the 64 and Ostrman for both. Which did he prefer?

47

### Word processing round-up

Chris Durham takes a well-earned breather from his Herculean task of reviewing WP packages for the 64. He's done a dozen, and there's more to follow. But it's time for a mid-term report on the 64? What should state of play is professional word processing really feasible on the 64? What should you look for in a word processor - and what will you have to pay? How do the packages he's reviewed already compare with each other?

## Deals for Readers returns - bigger and better!

The early summer bustle in our mail-order section is now over. And we've been using the time well - more products, more discounts to offer you. Like a decent tape database package at a good price like a very fine assembler/monitor/editor package for Vic and 64 like not one but two Commodore User cartridges for the 64, one an excellent set of toolkit commands and the other with a strong collection of extensions to basic Basic - and there's more!

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ON WITH THE SHOW

## Screen scene for the 64

After last month's excursion into disk based games, we're back to the latest offerings on tape. Some duds, but also some champions

## 64 virtuels

Among this month's offerings is a program that allows you to draw pictures on the 64's screen in 32x32 mode - using a joystick.

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## All about wedges

Wedges are very useful for keeping doors open, but there's more to them than that. You want to add extra commands to Basic for use in your programs? The Wonderful Wedge lets you do just that. Chris Preston shows you how.

## Commodore's seal of approval

The Commodore Approved Products Scheme started about five years ago, embracing its "real" selected Commodore-oriented products from independent suppliers. Is it a rip-off? A gimmick? A guarantee of respectability for the supplier? A safeguard for the users? Richard Buncik found out how (and if) the Scheme works - and ponders on whether the accolade represents any real value.

## The Directory of Commodore User Groups - part one

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Whether you're in Worthing or East Orkney, there are users eager to share their computing - and there'll be a club with a Vic and/or 64 bus just waiting for you to join. We've been collecting and updating our information on user groups in Britain and abroad - almost everywhere except the USA, in fact. We go State-wide next issue.

## 64 Book Look

A mixed bag of bibliophilic offerings this issue, but something for all tastes: yet another attempt to provide a definitive 64 handbook, a book of programs and for the uninitiated, a general introduction to personal computers.

92

## A taste of Paramount

Software is moving on the Vic and 64, and is looking for a small range of best sellers. Richard Buncik took the early train to Stockport, to find out how Paramount intends to live up to its name.

## Tommy's Tips

No respite for Tommy: he continues to plough indefatigably through readers' queries. This issue he looks at the Vic's less-than-friendly RS232 port, the 64's screen display and a 'Monopoly' program

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## Write Away

Suggestions, complaints, constructive criticism - even praise? You write, we read.

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## At last - the wired CBM

Commodore's sneak announcement this month is a modem for the 64. That opens the world - literally - to every hacker with enough wit to be able to plug in a cartridge and dial up a sequence of 21 figures.

Karl Dallas has been talking to CBM's Computerware computer in Ohio, USA - and running up enormous phone bills ever since Commodore let him the first of them. Here is his report.

After all the talk in recent years about the wired society Commodore's entry into the new age was almost an anti-climax and a complete contrast to the razzamazz of their announcements at Hanover in April.

In fact, if you weren't already wired up yourself you would certainly have missed it the only word to come out from Slough was whizzing John Collins' happy announcement to Micronet 800 subscribers (on page 800912293, if you'd like to read it for yourself) that the 64 modem was at last available. He also said that "several" of the modems (I understand the exact figure is about 3,000) were in stock and ready to go to everyone prepared to fork out just under £100 for them, mail order only (in case you think Commodore is getting a touch of the Clive Sinclairs, let me reiterate that the modems do exist and are ready to mail right now!)

This is really good news to me especially, because for over a year I've been trying with no success whatsoever and increasing frustration to link up my computer to the rest of the world. In fact I even went to the extent of getting myself a Spectrum because I'd heard the problems had mostly been solved on Uncle Clive's icky-keyed darling.

For most people wiring up to the world means one thing: joining British Telecom's Prestel network by way of Micronet 800.

Prestel is just a huge mainframe actually, three mainframes crammed with all sorts of fax and info that people might want to know from the top of the Charts to the current price of wool futures in Sydney, Australia.

But really it's one of those great ideas that's still waiting to



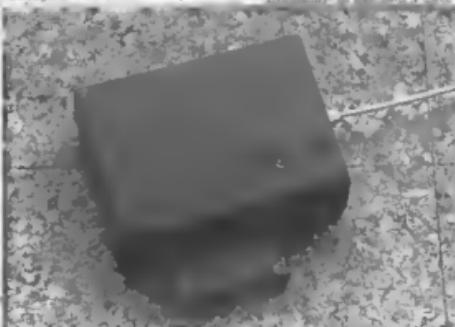
take off, a solution waiting for a problem to deal with - regarded by people with proper databases as something of a toy fascinating to play with, maybe, but (unless you happen to be one of the travel agents who seem to find it very useful to check things like flying times and the latest cheap tours) of no practical use.

When a first came out Prestel was touted around by the TV rental firms, and you had to communicate with it by a numeric keypad which was fine for yes/no choices, but didn't offer much chance of real interactive communication. Then one or two companies started making black boxes which allowed a micro to talk back to the big brother mainframes, and at the 1983 Which Computer Show there came the break-through of Micronet's cheap and

cheerful way of connecting up micros to Prestel and even down-loading telesoftware (then free) on to them. Among the machines able to do it were the BBC, the Spectrum and (I was assured) the Pet. "Including an 8056?" I asked, and was told yes, but there wouldn't be much business telesoftware available for a while.

I won't bore you with the long months of fiddling around inside various Pets trying to connect up UART boards to the J3, J4 and J10 pins on their CPU's, the modems supplied and special sockets fitted for me by the GPO (including a special old-fashioned handset), since I found the acoustic coupler supplied by Micronet didn't fit the new-style receiver's being advertised so actively by BT.

Eventually, as I've said, I gave



up and got a Spectrum, which worked first time but only a week later I spotted the news about the 64 modem, which makes everything before it like rocks from the stone age. It's a rather bulky black box that plugs into the car port with a long lead and one of those new-fangled square jackplugs BT are fitting wherever they get the chance.

With the modem supplied by Micronet's affiliate Prism for the Spectrum, you have to dial up the company (either 666 0311 or 618 in London) on the phone, then when you hear the high-pitched carrier signal you flick the 'on-off' line switch down, return the receiver, and, with about a 50% chance of success you're on.

You have to type in a ten-figure customer identifier followed by a four-figure password (to stop people running up bills on your account) and you can start finding out things you thought you never wanted to know and were probably right.

The 64 modem does all the dialling for you. But lots of old fashioned TV-plus-keypad set-ups can't program their equipment to take care of the identification codes, there appears to be no way of doing this with the 64 modem. I have no problem remembering my nine-digit VAT registration number, so I suppose one extra number shouldn't tax my memory very much. In the meanwhile, I've written it on a sticky label on the modem.

A bigger problem, if you have to confine your hacking to popular times like Saturday afternoon, is that if the computer is tied up the modem disconnects automatically after a short wait. Surely it could have remembered the number and kept redialling until it got through?

## K-tel disks

K-tel has joined the increasing band of software houses now making cassette games available on disk. That means you'll now be able to buy three of its games for the Commodore 64: *Claytrakk Odyssey* and *It's Only Rock 'n' Roll* - on disk, for £9.95. Will you be able to resist the floppy onslaught for much longer?



## Discover these new games for VIC-20...

These six new games written in 100 per cent machine code, set high standards of playability and really make the most of everything the VIC has to offer. Games of action and strategy, great graphics, glorious colour and full sound effects. Try Submarine Commander, Tower of Evil or Mine Madness and you'll want to try all six.

You should be able to find these games from Creative Sparks at your usual software supplier but you can also order them directly from us, completing the form below.



All action game with strong strategic element. Penetrate the enemy defences and blow up the ammunition and fuel dumps.

This great game features:

- Superb sound and graphics.
- Smooth action scrolling screen.
- Joystick or keyboard operation.
- One or two player game.

Requires 8K RAM expansion.  
Cassette £5.95



Attack and destroy all enemy shipping. That is your brief in this exciting game of strategy and tactics. Find the nerve tingling action spread over three screens provided by this amazing game.

Already a big hit in the USA.

Superb scrolling screen in perspective mode. Nine pre-selectable levels of play. Keyboard or joystick operation.

Requires 8K RAM expansion.  
Cassette £5.95



Action rages throughout. Move from 70 rooms in the maze-like Tower of Evil, inhabited by such evil creatures as the Baphomets and the Warriors of Apocalypses. To defend yourself, you throw fireballs from your fingertips on your journey to rescue the princesses. Superb action graphics in this 100% machine code game.

One or two player game.

Joystick or keyboard control.

Requires 8K RAM expansion. Cassette £5.95



Gold mining with a very big difference. Half-crazed monsters and bats which eerily move up and down of their own accord have to be faced in this unusual game.

Seven levels of play.

High score feature.

Keyboard or joystick operation.

Runs on unexpanded Vic-20.

Instant plug-in cartridge action at cassette prices £5.95



Protect the powerhouse from the crazy mutants with the help of your powerful crewed war tanks. Guide the tanks into the mutant burrows to destroy the eggs. This unusual and exciting game benefits from two screens of action play.

One or two player game.

Runs on unexpanded Vic-20.

Instant plug-in cartridge action at cassette prices £5.95



Based on the hit movie "War Games". Using both strategy and good shooting destroy the incoming missiles and avoid the holocaust.

An amazing game with superb scrolling landscape when tracking missiles. High tension play when trying to crack the code.

Keyboard or joystick control.

One player game.

Requires 8K RAM expansion. Cassette £5.95

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## Software briefing

Commodore's recent Software Briefing may have sounded like a high-powered affair but it wasn't. It merely gave already sag-hardened journalists the chance to try out Commodore's latest soon-to-be-launched software offerings.

That amounted to a whole range of educational and games software (it's getting difficult these days to distinguish between the two) - mainly for the 64. A solitary not plugged-in Vic lurked at the far end of the table. We were assured that new games are being launched for it. So why weren't they being displayed? Well, someone had forgotten to bring the required RAM pack - a lame excuse.

### Fishing for games

For arcade action enthusiasts Commodore was displaying a range of five games for the 64, *Maghem*, *Pandora's Box*, *Punchy*, *Little Icarus* and *Humphrey*. Names sound familiar? Quite right, they're all from the Mr Micro software house.

Commodore doesn't write its own software, it regularly engages in what Commodore UK's software boss Gail Wellington calls 'a cast-the-net operation'. Having cast it, she hauled in Mr Micro, for two reasons: 'they have good software, and they were willing to be marketed. Mr Micro is more interested in creating than marketing software.'

With Commodore's mighty marketing muscle behind it, Mr Micro is already working on new material exclusively for Commodore - and probably smug while he does so.

The five games will cost you £3.99 each on cassette. But disk drive owners can buy the whole set on one disk for just £19.99.

that sounds like good value.

Unlike some disk based games these don't make full use of the disk's increased capacity. But many of them look quite good and original. *Lake Pandora's Box*, for example, which displays a nice 3D effect, you try to stop various nasties leaving the box. In *Little Icarus* you fly the winged youth through mythical Greece to find his dad - don't fly too near the sun, though. *Punchy* is based on *Punch and Judy* complete with sausages and rotten tomatoes.

And it looks as though the trend for acquiring games from already established software houses will continue. Apart from Mr Micro, Commodore is dealing with Starcade to market its *Savage Pendulum* game for the 64 under the Commodore umbrella and there's a link with Widget Software too, though no details are to be had yet.

### Work and play

Commodore has also acquired some educational games for 8-to-12 year olds from Applied Systems Knowledge, a London software house specialising in 'fun learning on micros for kids'. The range is available for the 64 only and most of the games come on cassette at £5.99 each.

On cassette there's *Let's Count* four counting programs for tiny tots, *Hide and Seek* a visual memory game two cassettes for £9.99, *Face Maker* lets you make a multitude of ugly/funny faces, and *Words, Words* uses words to build up a picture from a range of ten scenes (two cassettes for £9.99).

Last but not least is *Number Painter* a *Manic Miner*-type maths game with pretty impressive graphics. That's being produced in cartridge form, costing £9.99. And Gail Wellington's pretty pleased about it. It's got the playability necessary for education games.

### In the picture

Commodore's also got something for the more creative-minded. Both the drawing packages we mentioned briefly in the April issue of *Commodore User* were on display.

*Rob Harts Picture Builder* (cassette only £5.99) is a low resolution package. You use joystick or keyboard to select and draw with any of the characters and graphic shapes the 64 can produce. More advanced is *Tony Hart's Art Master* (cassette £5.99, disk £9.99) which gives you a high-resolution drawing facility also using a joystick or keyboard.

Finally, to the Vic. This gets a program called *Magic Writer* (cassette, £9.99) allows you to compose a tune and play it back in various different forms. The Vic also gets a range of arcade-type games on cassette for £4.99 each, and there's a four-pack of unexpanded games two for £9.99.

### Speaking out

So what's Commodore got under development? Well, it's introducing more software to run with its *Magic Voice* speech synthesiser for the 64. The latest project is the *Talking Books* series titles include *Magic Garden* and *Magic Toolbox*.

Each package contains five stories for children to read and write. Sections of text are illustrated on the screen and 'read' by the voice module. There's a dictionary too, so children can get an explanation of any words they don't understand - no prices or availability dates yet, though.

You need *Magic Voice* to make the Talking Books work, but the module is optional for the 8.1 or *8x10* series of basic reading and writing programs. Those are being developed by the Educational Psychology department at Birmingham University - real educationalists. Again, no real product or prices yet.

So it looks as though Commodore's commitment to software is continuing according to plan - not just to games but to more practical and useful software. Moreover, it's not just announcing availability but showing us the real stuff - unusual for Commodore.

## Robotic chores

BP Oil organised its first Biddabrobot Competition last year. That generated such a lot of entries - over 1,000 of them, especially from schools - that it's running the contest again.

But this year the sophistication level is going up.

Last year, BP asked you to build a robot that would retrieve a cube. This time you're set the more ambitious task of constructing either a tree-ear robot to perform a useful domestic task or go for the set challenge of building a mobile robot to serve a drink to each of two people seated in a room (mine's a double).

No need hurry, though. The National Finals aren't until October 1985. But you must be aged under 19 on 31 August of that year to be eligible. Prizes? Those haven't been fixed yet but the total hand-out will be more than £3,000.

Last year, winners got £500 each with lesser sums for runners-up (and that figure should increase this year). Of course, money isn't everything, you could get yourself on the tally (last year's winning robot chased Selena Scott round the TV AM studio - no extra prizes for that).

According to Brendan Lomax, BP's PR man, 'all sorts of computers were used but quite a few entries were based on the Commodore 64'. He emphasises that the competition is really designed for schools, so if you hasn't received BP's information pack, it can acquire one from Mrs Francis Parker at BP Oil Ltd, BP House, Victoria Street, London SW1E 5NQ.

## Subscription problem?

We do not keep our subscription records on the premises, so if you have a query, calling us only adds time and doesn't solve the problem.

Please send a description of the problem to: S&T Subscription Services Dowgate Works Douglas Road Tonbridge Kent TN2 2TS

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**IN THIS ISSUE**

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## JUMPIN' JACK 64

Not just a game... an Experience!

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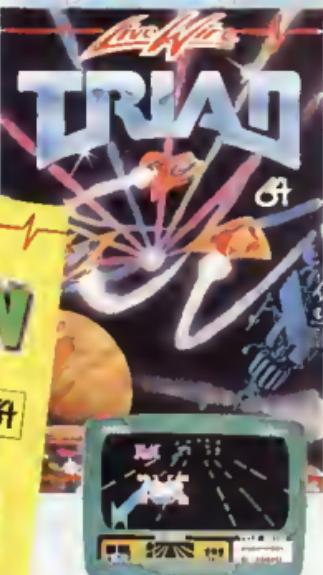
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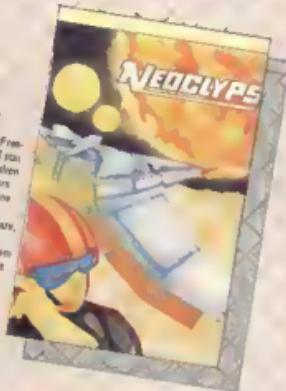
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The object of this game is to defend your city against an all-out attack of suicidal aliens. £7.95



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*News*

## WE PLEAD NOT GUILTY

Dear Voice of the Industry

### COMPUTER GAMES PIRACY

This letter is being sent to all specialist microcomputer magazines and concerns the cancer that is eating the very heart of our industry.

Computer games software is the dynamic success story of the current economic recession and is an area where, for a change, Britain has a tangible lead over competing countries. The games software industry is part of the emerging leisure technology industry and our lead in games will be reflected in other areas of technology as they emerge, given a chance.

The boom in games software has created jobs, not only directly but in printing, duplicating, advertising and in the magazine industry. As leisure technology progresses it could become a major source of employment.

All this is being jeopardized by the selfish activities of members of the public who are copying games instead of buying them, this is theft. We are not talking about isolated instances, we are talking about "user groups" running multi-production lines at their evening meetings and stealing as many as 2000 copies of successful individual titles at one go. Conservative estimates regard seven copies for each legitimate product as being a realistic overall picture of the marketplace.

This is risking the livelihoods of everyone in the industry, including the magazines. The games companies have far less to spend on advertising space and if the epidemic continues will have less still. This is the reality of the situation.

The media is a powerful force yet in this instance is doing little or nothing to use this power. Some magazines even carry small advertisements for blatant copies, some magazines have actually carried editorial condoning the thieves. They are cutting off their nose to spite their face.

The time has come for all computer magazines to follow a concerted campaign to stop piracy. Editorial must campaign for law changes creating harsher penalties. The copying clubs must be exposed. Advertising executives must filter out the pirates adverts. Piracy must become unpopular.

It is no good expecting the software companies to solve the problem, they have not the organisation or power - it is the



media that has. Any magazine that does not act is not facing up to reality.

**David Henry Lawson**, chairman, **Mark Lawrence Butler**, managing director, **Ian Betherington**, financial director, **Bruce Everiss**, operations director, **Imagine Software Ltd**, **Imagine House**, 5 Sir Thomas Street, Liverpool, Merseyside L1 6BW.

In your assessment of the software market you will have noted the general concern over the levels of illicit copying of programs. It is believed to have reached.

The Guild of Software Houses is active in seeking measures to restrict this threat.

In this respect magazines can assist by adopting a responsible attitude in the acceptance of advertisements which may be considered against the best interests of the industry.

The commercial success of any publication is, of course, the criterion and revenue from this source is a fundamental consideration as is the continuation of creative products which provide a significant information base for journalists and their medium.

The displays generating most consternation appear to be concentrated in the classified section.

It is now time for the press to be seen to act in a creditable manner and support this campaign to eradicate piracy.

Response on the matter will be measured in the form of a survey conducted by G.O.S.H. during 1984.

Yours faithfully

**Rod Cousins**, Vice Chairman, Guild of Software Houses.

## COMMODORE USER SAYS:

So software piracy is the fault of the micro media, is it?

Of course, if illegal copying on the scale alleged by Imagine's letter is going on - and we await the prosecutions of those "user groups" (their quotes) who have employed assembly-line techniques to duplicate as many as 2000 copies of successful titles in breach of copyright law - is it to be condemned? and we do condemn it, as regular readers will know.

On the other hand, the industry's obsessive concern with "protection" puts the honest user wishing to create security back-up copies, or a suite of much-used programs on a single disk, into the dock alongside the true pirate. That often diverts energies which might be better devoted to improving the basic product and ensuring a viable after-sales service to users, particularly of business and utilities software.

This letter ignores the motivations of most of those who resort to "piracy". Rarely is it the sort of big business that bedevilled the video trade. It's more like the situation in the music business, where people resort to copying albums on to tape because it's one way of ensuring a reasonable-quality version of the best music on offer rather than the click-and-hiss compilations of occasional highlights surrounded by track after track of mediocrities that is the average contemporary pop LP.

Similarly, there is so much duff computer software about - duff that won't LOAD or RUN, and duff

that's boring or doesn't deliver what is promised on the box. It is hard to condemn those who want to share their discoveries with their micro-mates.

Nevertheless, if the Imagine directors want to condemn piracy, then OK: computer piracy is wrong, immoral, and ought to be illegal, if it isn't already (we need a test case to prove whether the copyright laws actually apply).

• We are also against six (some size, anyway): but we don't think prior declarations will abolish it.

And we are always against manufacturers distributing software that has been inadequately debugged, duplicated without the necessary quality-control to eliminate the non-RUNexecs and presented in covers whose art bears scant relation to the image on the screen when it's finally persuaded to perform.

As a magazine, we like to think we are doing our part to weed out the duff programs. We do refuse ads that we know are for copying devices and programs, though these are readily available elsewhere, and anyway we doubt that they are the real cause of the trouble.

We are also opposed to so-called "cures" like the tape levys and similar walnut-crushing steamhammers being proposed in some circles. These are generally worse than the ills they are supposed to handle, and they extend Government interference into areas of life and recreation where the snooper and the money-grabbing bureaucrat have no business intruding.

We don't think anyone owes us or the software companies a living. And we regard their advertising with us, not as charity from a grateful industry but as a hard-headed, commercial acknowledgement of the editorial policy which made us the best-selling user-specific micro mag within a month of our going on to the bookstalls.

**PIRATES** were high seas robbers using an armed vessel without legal permission. They waylaid and robbed any ship that looked like a likely prize. Piracy is as old as sea-trading. The great Roman, Julius Caesar, was once captured by pirates.

The most dreaded pirates of the Middle Ages were the Saracen pirates, with their headquarters in Algiers and neighbouring ports. They had a particular fondness for capturing Christian sailors, whom they sold as slaves.

The nation of the Spanish West Indies was the pirate's natural habitat. They lay claim to all the Portuguese and Spanish islands and, above all, managed a piracy-free zone out of the mouth of the Amazon.

During the 16th century, pirates



## Late for Valhalla?

Legend's Valhalla was launched last October on the Spectrum, it's grabbed £2 million in sales since then and has won two games awards. But it's only now available on the Commodore 64 at a beefy £14.95.

That's seven months after its initial launch and a sackful of assorted computer games have grown old and mouldy since then. Why has the conversion taken so long? And is Valhalla on the 64 a legendary dead duck?

"The 64 poses a lot of technical problems", explains John Peel, Legend's proprietor. "Converting Valhalla to the 64 was more difficult than actually writing it for the Spectrum. But that conversion is a dramatic improvement on the original. Everything happens more quickly, making the game more challenging."

Peel has no doubts that, despite Valhalla's comparative longevity, it will sell on the 64. "We expect it to reach the top of the Commodore charts immediately on release - we've already got over £250,000 of advance orders. Valhalla is unique, it's not an adventure game but an interactive computer movie." We'll be reviewing it soon, popcorn in hand.



## Cut-price games

The computer games software industry has already publicly aired its feelings about illegal tape copying, gloomily predicting the industry's demise if the pirates aren't scuppered.

But more unifications of disaster follow this time from Derek Meakin, head of National Micro Centres (sounds very official, but it's a retail shop chain).

According to him, the industry may soon see "cutting its own throat", thanks to the cut-price operation of Mastertronic, a new games software company.

Mastertronic has what is called "a revolutionary pricing policy", that means you'll pay just £1.99 for a game-tape three times the price of one, as it were.

Is Mastertronic trying to prove something? "Mastertronic will endeavour to prove what the market has long believed - that software's currently available is generally overpriced." So asserts Martin Alper, one of Mastertronic's directors.

Over to Meakin: "This might sound fine for the computer user. But many of the software houses are working on very tight margins already, and a price-cutting war could well bankrupt the more vulnerable ones."

Then there's the question of remuneration for software writers; if the royalties are low, "this means that quality and standards will slide rapidly".

Of course Mastertronic doesn't see it that way; it's offering those small software-writing concerns the chance to sell in large volumes, with Mastertronic using its distribution and marketing skills to sell to supermarket chains, garages, newsagents, to fit

dealers and the like - places you wouldn't expect to find games. The intention is to encourage what it calls "impulse buying". But you'll also find the Mastertronic range in places like Boots, W. H. Smith and the retailers supplied by the big distribution chain Websters.

Mastertronic took a stand at the recent Home Computer Show in Manchester and reportedly generated a great deal of interest - albeit with few sales. People weren't sure what to make of its bargain-basement games, it seems.

But that was a few weeks ago. Martin Alper now reports that in its first three weeks Mastertronic sold 165,000 games nationally and that one dealer clocked up sales of 400 in two weeks - somewhat quicker than selling hot cakes.

More than twenty "top quality games" titles are already available, of which eleven are for the 64 and four for the Vic. And Mastertronic is aiming for 80 titles by the Autumn, with plans for educational and business software. We've got a bunch for review and will be reporting soon.

Obviously the games sell because they're cheap but Alper doesn't see them as a substitute to top-quality and more expensive games; there's a strong place for those too. "The industry will settle down into a two-tier system. Our games don't take long to develop and will appeal to a lower age group." And their boredom threshold won't be very high - so you buy another one. Looks as though the age of disposable games has well and truly arrived.

## Plug

According to B&R Electrical Products, a lot of sensitive electronic equipment is at risk from sudden spikes or surges on the mains - office computers and word processors, electronic typewriters, home computers, videos, cash registers, hi-fi equipment, instruments and controllers, and so on.

Mains-borne interference like that can be generated by switches, fluorescent lights, motorised equipment, air conditioning, vacuum cleaners, washing machines, printers. These everyday surges can be in excess of 3000V; thunderstorms can easily generate over 10,000V on the mains.

You won't then be too amazed to learn that "for such sensitive and valuable equipment B&R recommends fitting its new PowerCleaner surge suppressor plug". This just replaces an existing 13 Amp mains plug, yet it can provide a dramatic reduction of up to 99% in equipment damage or disruption.

Most modern electronic gear is designed to withstand surges to 600 or 700V. Anything greater than this can actually cause permanent damage, though a one-time loss of data or program is more likely. The PowerCleaner plug effectively limits surges to 625V, a level at which B&R says "tests show a 99 per cent reduction in equipment damage from spurious surges".

Priced not unreasonably at £8.65 plus VAT, PowerCleaner is available from B&R stockists; further info on 0279 34561.

## SHORTS

**Button up:** Standard Commodore joysticks don't have a pushbutton on top of the stick, which happens to be an obvious and very handy place for a fire button because you can fit it with your thumb. But for £2.95, Computer Supplies will send you a Top Fire Button Kit with which you can quite easily add your own. We've tried it, the button itself is a bit small but it works, and it does improve the joystick. If you don't fancy putting it in yourself, send your joystick with £4.45 to Computer Supplies at 146 Church Road, Boston, Lincs PE21 0JX. Barrie Hill at Computer Supplies also told us he can handle just about any repair to joysticks.



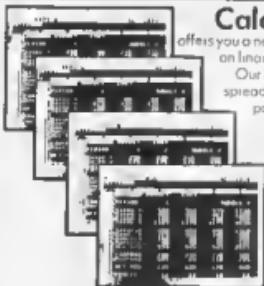
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descriptions now use the spread sheet formula for instant feedback and analysis of trading results. In a world where ease of access and speed of assessment are essential, CALC RESULT gives everyone the power to harness the untapped potential of their Commodore.

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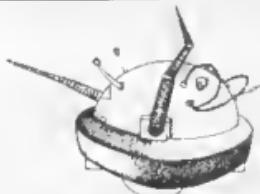
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Thinking ahead	

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*show*

# Four new machines, and that's official!

Excitement among the estimated 40,000 keen punters expected to attend the Fifth International Commodore Show at the Novotel, Hammersmith, London from June 7 to 9 will become even greater with the now official news that the company will be showing no fewer than four out of the six new machines premiered in Hanover in April. (see last issue) and that these are all definitely planned for release within the next six months.

The new ones are (in rising order of price)

- **Commodore 16**, a 16K machine due for September release at about £390 (all prices including VAT), possibly also in a £130 'starter pack' with cassette deck and software. Described by Commodore as a very advanced home computer with features normally found on computers costing much more, designed with first-time users in mind, in many ways the 16 could be considered as a 16K version of the 64. It has a slightly more sophisticated keyboard than its big brother, with four arrow-shaped cursor keys and a help key. Thus, they say, will be 'a great asset when learning to program' since 'it highlights errors in lines of programming right down to individual instructions and tells you why they went wrong'. The 16 has Basic 3.5, which has over 75 commands 'including built-in graphics and sound commands' as well as the usual toolkit functions often purchased separately, a built-in machine language monitor and a screen windowing capability.

- **Commodore's Plus 4** originally known as the 264), also due in September at a probable price of £290 or so. At first sight, the main difference between the 16 and the 364 seems to be the 60K of user-available memory available in the latter machine. In fact the total ROM and RAM in the Plus 4 totals 96K. It will now come with 'Three Plus One' (hence presumably, the Plus 4 name) integral software, resident in ROM, consisting of a word processor, spreadsheet, records management (more of a mailing list program, rather than a fully-fledged database), plus a sophisticated business graphics program.

'Three Plus One' was originally one of the lemmas of the 364 but there are now



no plans to release this machine in Britain.

- **The 8296**, an addition at the top of the 8000 business range, is actually being delivered now at a price of £114.25. It is similar to the 8096 except with 34K system memory in ROM and 128K user RAM. It is upwards compatible with the rest of the business range meaning that 8032 and 8096 software will generally run without modification but some exciting other languages will also be available, including UCSD Pascal.

- A further addition may come with the much talked about Commodore PC, based on the

IBM compatible Hyperion. Details concerning its impending launch were unavailable at time of going to press.

- **SFS 401 disk drives**, with a maximum data transfer rate of 1675 bytes per second, allowing an average access time of 285 milliseconds.
- **DPS 1101 daisywheel printer** using a 100-character Triumph-Adler compatible typewriter, bidirectional printing at 18 cps, switch selectable between CBM ASCII and standard ASCII, switch or software-selectable 10/12/16 or proportional pitch, offering underlining, bold and shadow print, horizontal and vertical tab, subscript and

superscript.

- **MCS 801 dot-matrix colour printer** allowing seven-colour dump high-res screen and letter printing at 38 cps with an 8 x 8 matrix.

- **1703 high-quality colour monitor**, suitable for use with a computer or VCR, and having a front-mounted composite video socket and rear-mounted sockets for luminance and chrominance and audio signals, in keeping with the current trend towards component video.

- **1531 cassette unit**, similar to the familiar C2N cassette drive, but with a DIN plug for the 16 and Plus 4 and a recording light.

In addition to the Commodore displays of hardware and software and the individual exhibits, the 'features' of the exhibition itself will attract enormous interest, with the involvement of Radio Luxembourg on a daily basis, daily seminars organised by ICPUG, featuring lectures on the new PC, the shortly-to-be-launched Computer service for owners of the C64 modem, legal protection of software and disk access as well as a problems 'surgery' (see panel for full schedule).

There will also be international football and basketball challenges, learning soccer and basketball stars playing the highly acclaimed cartridge games, TV stars and planet presenters Patrick Moore introducing his astronomy program, BJ the Bear star of the new talking educational software, appearing in person. A business simulation using the lamed Copland software and illustrations of entries for the international computer art challenge, in a setting allowing would-be electronic artists to have hands-on experience of programming graphics are other attractions.

Users outside London will have a second chance to see the goodness on display at the Northern show in Leeds from September 27 to 28.

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show

# ON WITH THE SHOW

## ACCOUNTING (BUSINESS)

Anagram Systems	D19
Electronic Aids (Tewkesbury) Ltd	A2
Handic Software Ltd	D13
JCL Software Ltd	C27
Micro-Simplex Ltd	
AS1/AS2/AS3	
Pegasus Business Software	
Quick-Count Ltd	F61
Saxons Computing	A68
Supersoft	A1
	A43

Accounting packages for the small-to-medium size business increase in their power and sophistication, for instance Anagram Systems' INTEGRATED ACCOUNTING SYSTEM, v.4 and STOCKMASTER, both available for both the 8000 and 700 series, as well as their fully-integrated single-disk programs.

Such software is also becoming available for the less powerful machines, for instance Electronic Aids' range of programs for the 64, added to their already well-known series for the 4000 and 8000 machines, such as PAYROLL and INTEGRATED ACCOUNTS, including purchase ledger, with ageing creditors, sales ledger with invoicing to the user's own design, statements, daybooks, VAT analysis, stock control, automatic posting to general ledger with manual override, nominal journals, trial balance, complete audit trail, management reports, profit-and-loss, and balance sheet.

SUPERCLERK, a complete word processing/accounting/filing and payroll program for the small business, and HOTEL SYSTEM, including guest billing, stock control, guest records, word processing, and filing, will be shown by JCL Software.

The name of Simplex, associated with some of the more

popular accounting stationery, is a hallmark on the Micro-Simplex off-the-shelf accounting system designed to run on the 8000 series, with entries to that used in the familiar Simplex D books.

Another powerful package comes from Pegasus, actually a suite of seven programs, available individually or as an integrated system, consisting of invoicing with sales order processing, stock control, purchase ledger, sales ledger, nominal ledger, payroll, and job costing.

A CASH TRADER'S BOOK KEEPING SYSTEM for the 64 can be rented for as little as £5 a week, complete with hardware, from Quick-Count Ltd, who will also be launching a LEASEHOLD PROPERTIES RECEIVABLES program which is believed to be the only one of its kind (£14.95).

## ACCOUNTING (HOME)

Adamssoft	A111
Anagram Systems	D19
Handic Software Ltd	D13

The power of home machines like the 64 brings many of the electronic business tools to a much wider market, for instance CASH BOOK 84 from Anagram which has extensive nominal ledger and can produce profit and loss reports - very valuable for the self-employed or part time businessman or club treasurer.

Other useful home programs include CHECKBOOK MANAGER and BUDGETEER from Adamssoft.

## BUSINESS PROGRAMS AT THE SHOW

Anagram Systems	D19
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## ICPUG SEMINARS AT THE COMMODORE SHOW

Thursday June 7 16.00

CompuNet and Networking  
Brian Grainger

Thursday June 7 17.00

The IBM PC and how it relates to CBM  
Simon Trammer

Friday June 8 16.00

Legal Aspects of Software  
A. Kehuan

Friday June 8 17.00

Disk Storage  
Mike Todd

Saturday June 9 16.00

Adventure Games  
P. Gerrard

Saturday June 9 17.00

Problem Clinic  
Simon Trammer

APS Microsystems	B37
Dataview Wordcraft Ltd	B35
Handic Software Ltd	D13
Impex Designs (UK) Ltd	A65
Micro-Simplex Ltd	
AS1/AS2/AS3	
Pegasus Business Software	
Precision Software	F61
Quick-Count Ltd	H69/A16
Saxon Computing	A1
Supersoft	A43
Tamsys	B31
Viza Software	A135/A136

Commodore business users who have so far been limited to the 96K memory of the 5066 with its rather complex memory banking, will be pleased to learn of the new generation of business machines on the horizon: the 138K 8296, the 256K 8200 with Unix availability, and of course, the redesigned Hyperion, to be known as the Commodore PC, presumably to emphasise its IBM compatibility (see report from Hanover, last month).

All of these are expected to be on show, if only in prototype form.

Not 64 users will be excited to know that they won't be left out of the bigger memory stakes. RAM Electronics are hoping to have a prototype of their new 256K expansion cartridge for the 64 at the show, and they're talking of a 512K expansion ready next year at about the time the first CBM PCs should become available.

More CPU memory, of course, also implies more memory required for data storage, and two 'third party' companies will be offering hard disk and multi-megabyte cartridge options.

APS Microsystems' ALPHA 10 is a removable mass-storage cartridge for the 8000 and 700 series business machines, available in 10, 20, 30 and 40 megabyte versions with 20Mb of

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COMMODORE  
SHOW**

on-line storage, fast backup and infinite off-line capacity, a 1.13 Mbytes data transfer rate and a typical access time of 10 msec, allowing 10 Mbytes of data to be copied in under ten minutes.

Also available is the BETA 5 with 5-8 Mbytes of storage and the low-cost GAMMA 5 Mbytes Winchester at around £1500.

Small Systems Engineering will be offering up to 93 Mbytes of storage in a new high-speed single and multi-user hard disk system, allowing up to 64 users to share a single drive.

Capacities available are eight, 16, 25, 40, 65 and 90 Mbytes, and all models have integral on-line tape backup, built-in error-correction code and dynamic display of drive status. CBM DOS enhancements, including multi-user file locking and passwords, and a complete range of utilities.

With local area networking becoming a current buzzword, there'll be a lot of interest in Dataview's HYDRA local area network, allowing CBM 64s to act as low cost collectors of data, with an 8000 acting as overall controller.

Terminal and communications software have been added to the programs offered by Impex Designs with their VIDEO FAX 80 80-column cartridge for the 64, along with word-processing and an 1100-cell spreadsheet.

Of major interest to business users will be the powerful CORPLAN business simulation game running on the 64 on the main Commodore stand.

Previously available only for the 8032 and 8096 business Pcs, the game has been specially rewritten for the Show, employing sophisticated graphics.

Basically, Corplan allows players to assume the roles of production director, sales director, finance director, and managing director/charman of a company manufacturing Corplex (whatever they may be). They have to manage resources, plan advertising budgets and sales campaigns (including keeping the right numbers of raps on the road), maintain stocks, and ensure profitability - which determines how the company's shares do on the stock market.

## DATABASES

Precision B69/A146  
Supersoft A43  
Viza Software A135/A136

## STIRLING RETURNS TO LE MANS

Veteran racing driver Stirling Moss will return to the Le Mans circuit, in spirit at least, when he takes on all comers in the popular game at the Games Arcade at the Commodore Show.

He will also be introducing his son, Elliott, to computer cartoon character B.J. the Bear in the new range of speaking "Magic Voice" software.

Another visiting celebrity will be Chris Biggins, from ITV's "Surprise Surprise" and he'll have some surprises for visitors up his sleeve.



More properly described as information retrieval systems, databases are now attracting the attention of the small user, with their facility for storing, extracting and manipulating all kinds of data, from mailing lists to records and video catalogues.

Perhaps the biggest news here is from Precision, who will be first off the mark with software for the forthcoming 16-bit Commodore PC, a rewritten version of their already popular SUPERBASE, increasing the maximum record size from 1108 to 2 Kbytes, and the total number of screen formats in a database up to 996, 240 columns wide. Also included is a comprehensive text editor and extended Basic interpreter.

SUPEROFFICE consists of an integrated program including SUPERBASE and SUPERSCRIPT II, running on the 8096, a truly superb package at a professional price (£799.25).

Meanwhile, a number of E15 applications packages have been produced to run under SUPERBASE 64, including some for the home (birthdays, diet plans, domestic accounts), and for business. Superbase has sold over 10,000 copies in its 64

variant, and is now selling at the rate of 3000 a month.

The cartridge-based MAGPIE from AUDIOGENIC, £99.95 is a very powerful program, entirely menu-driven, with maximum record size 3050 characters with 52 fields - 26 alpha and 26 numeric - plus calculator screen, menu-driven "procedure" (program) editing, and help screens on disk.

The more advanced programmer, interested in developing specialised database applications, will find virtually every facility needed in the Celco MASTER program, a suite of file creation modules, on a disk alongside disk utilities giving the 64 the equivalent of Basic 4. A version is also available for the 8000 and 700 series.

JCL Software have a 4K business ROM for the 8096 whose enhancements to Basic include Keyboard input, screen editing, and file read/write functions.

For the less ambitious, EASY FILE £50 from Commodore has a maximum record size of 306 characters over two screens, maximum field-size 40

characters, three levels of password protection, ascending/descending sort, and links with Easy Script.

## SPREADSHEETS

Dataview Wordcraft Ltd B35  
Saxxon Computing A1  
Supersoft A43  
Viza Software A135/A136

Surely everyone must have a spreadsheet by now, and is probably spending so much time checking out the "what if?" option that the business is fast collapsing around their ears, but will the new ones come?

Supersoft are promising us the latest version of the program that started it all, VISICALC3, while Viza's VIZASTAR is at last (it says here) up and running - though that's really a bit of a database hybrid with business graphics thrown in.

Supersoft will also be showing BUSICALC for the Pet and Vic and BUSICALC 2 and the 3D (linked sheets) BUSICALC 3, both for the 64.

Dataview will show their INSTA CALC/GRAPH integrated spreadsheet and business graphics programs, also available separately.

Although it could be described as either a spreadsheet, a database, or even a business graphics generator, FIGARO from Saxon Computing is actually a bit of all three, allowing data to be maintained and displayed in a wide range of graphic styles.

## WORD PROCESSING

Dataview Wordcraft Ltd B35  
Handic Software Ltd D13  
Impex Designs (UK) Ltd A65  
JCL Software Ltd C27  
Precision H68/A146  
Supersoft A43

The two big word-processing stories at the show will be Handic's launch of WORD RESULT, the powerful companion to Calc Result designed for the 700, with split screen window to access word processing and spreadsheet concurrently, and at the other end of the market - the modestly-priced disk version of WORDCRAFT 64 from the originators of the program in its various manifestations Dataview (not to be confused with the cartridge-based Wordcraft 40 developed by Audiogenic).

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# Software from a point of view.



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## How to get there

HammerSmith is in West London, of course, which makes the place pretty convenient from just about all directions except East Anglia and North East London. Driving there isn't too bad; the public transport services are excellent.

### By car

Getting to the Conrad International Hotel can appear daunting and is the subject of numerous apocryphal stories about haggard drivers circling feverishly around the Broadway looking for a way to it. But in reality it's not too difficult.

The main hotel entrance is in Shortlands and that's a no-way road connecting Talgarth Road and Hammersmith Road.

Coming from Earls Court and Central London you aim for the A4 and follow signs to Heathrow, Bristol etc until you reach the Hammersmith Flyover... otherwise

the next possible exit is a couple of miles further on. So get into the left-hand lane and take the side road signposted

'HammerSmith'; and at the next opportunity, turn right and make a U turn under the flyover. That puts you briefly on Talgarth Road going the other way; Shortlands is the first left.

Coming from Kensington and the West End, drive through High Street Kensington and past Olympia. You're then on HammerSmith Road without trying. Shortlands is the last turning on the left before you reach the ugly King's Cross roundabout at HammerSmith Flyover.

Coming from the West you stick with the A4 until you're offered the HammerSmith and Shepherd's Bush exit just before the flyover. Again, don't miss it: it's tricky to find your way back again. You follow the slip road on the Broadway, go right round the roundabout past the tube stations, and don't aim for Kensington – it might look the obvious route from the map, but there's no right turn into Shortlands from that direction. Instead take

the next exit signposted 'Central London'. This puts you on to Talgarth Road and Shortlands is the first left.

Coming from Shepherd's Bush and the North you aim for the Broadway, avoid the temptation of the Kensington direction, and follow the Central London sign again with Shortlands the first left.

Car parking is in theory available at the Hotel itself – there's an NCP car park under it but most of the space is likely to be taken by exhibitors and the Hotel's regular guests.

There are two other decent-sized car parks locally: one is off Queen Caroline Street (get on to the Broadway and take the exit after the Odeon); the other is behind the new shopping precinct called Kings Mall (take the King Street exit from the Broadway and follow the signs around to it – it's about five minutes' walk from the hotel).

Alternatively you might just be lucky and find a space in some side-streets. Your best bet is probably in the maze of streets just North of HammerSmith Road

### By tube

This is the obvious way to come if you live near a Piccadilly, District or Metropolitan Line station. On the Piccadilly and District Lines you look for the 'Broadway' exit from HammerSmith station, turn right past the Clarendon pub and search for the subway that gets you under the Broadway itself.

The Metropolitan Line exit is on the North side of the road so turn left and brave the traffic at the foot of Shepherd's Bush Road and try for the island of office buildings which also contains the Conrad.

HammerSmith is served by dozens of buses, too.

### Leaving by cab

If you need a taxi, you'll probably find some at the hotel or will be able to flag one on the Broadway. But there is also a cab rank on the corner of Shortlands and HammerSmith Road, and there's another at the junction of the Broadway and HammerSmith Grove.



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# OOPS!

When the Vic or 64 hits a problem, it puts a message on to the screen preceded by a question mark and followed by 'READY' with the cursor blinking on the line below.

Here's an alphabetical list of the error messages you might get, complete with possible explanations and what you can do about it. Where a line number is involved, that's given here as [n]: it indicates at which line in your program the error was detected, but note that this doesn't necessarily mean the error itself is actually in that line - it may have been caused by something else in the program.

Several of these messages are really obscure and definitely unlikely, some refer only to disk usage, and several involve concepts and commands that are outside the scope of an introductory look like this. But they're all here for the sake of completeness.

#### BAD DATA ERROR IN LINE [n]

The program was expecting numeric data and it got a character string. Correct the disk command(s), normally it's a READ or INPUT # statement followed by a numeric rather than a string variable (one with a \$ sign on it).

#### BAD SUBSCRIPT ERROR IN LINE [n]

You're trying to reference an element in an array that's outside the dimensions you set up with a DIM statement. You'll have to correct the DIM so that the array is larger, or change the array element number so that it's within the range.

#### BREAK IN LINE [n]

Not exactly an error message, just an indication that the program has been stopped and what line it had reached. This is usually because you wanted it to stop (you inserted a STOP statement in it to see how it was doing so far, or you hit RUN/STOP to halt it) or because you accidentally learnt on the RUN/STOP key.

#### CAN'T CONTINUE ERROR IN LINE [n]

You've used a CONTINUE command, but the program has been deleted or perhaps amended such that program execution cannot proceed.

The most likely cause, however, is that the computer has previously picked up another error and you haven't corrected it - it won't let you CONTINUE until that has been fixed. Your best option is probably to try restarting with RUN and see if that throws up an uncorrected error.

#### DEVICE NOT PRESENT

Probably means the device you're trying to get at (usually printer or disk or cassette) isn't connected to the computer or the mains. That's easily remedied, of course.

Sometimes though you'll get this message for no apparent reason - on my own set up it sometimes appears when I'm trying to read a file from disk while the printer happens to be switched on. The solution that usually works is to switch off everything you can and try again, alternatively OPEN a channel to the device you want to address and then re-attempt it.

This message can also occur if the devices are powered up in the wrong order especially if using two single 1541 drives. Experiment to overcome the problem.

#### DIVISION BY ZERO ERROR IN LINE [n]

The computer won't allow you to divide by zero. You might have tried to do

the by mistyping something, but it's more likely to occur within a FOR/NEXT loop or as a result of filling an array with numbers that you then use in a division. The easiest solution is to put in a check for zero on any procedure that might just produce one in a division.

#### EXTRA IGNORED

Someone typed too much in response to an INPUT prompt. You may also have inadvertently included a comma in your input. (The comma is used to separate fields and must not be used as an input character.)

#### FILE ALREADY EXISTS

The computer won't let you set up two files on disk with the same name or it won't tell you that - unless you're trying the COPY command, in which case you'll get this message. Give up and rename the file.

#### FILE NOT FOUND

You're trying to LOAD or VERIFY a file that the computer can't see on the up or disk. It's probably not there, but you may have mistyped the file name or misspelled what you called it.



#### FILE NOT OPEN

You haven't used an OPEN command when the computer wants one from you - which is before a CMD, CLOSE, INPUT #. So OPEN a file and retry.

#### FILE OPEN

You used an OPEN command on a file that's already open. Either you need to re-OPEN it, or you need a different logical file number in the OPEN command. If in doubt, CLOSE the file and OPEN it again.

#### FORMULA TOO COMPLEX ERROR IN LINE [n]

You asked the computer to do too much - you used an expression that is too many brackets or too many functions. Split up the expression somehow - that's good policy anyhow, since it will make life easier for anyone (like you) who has to read through and understand the program in the future.

#### ILLEGAL DIRECT

Most of the computer's commands can be used in immediate mode (i.e. they are executed as soon as you hit RETURN) or in programs (they are executed only when the program is RUN). But these are not valid in immediate mode:

DATA  
DEF FN  
GET  
GET#  
INPUT

If you really want to use these, you'll have to write a short program that incorporates what you want to do and RUN it.

#### ILLEGAL QUANTITY ERROR IN LINE [n]

You have a variable that is outside the computer's range. It usually happens when you're trying to POKE a value less than 0 or above 255. So don't

#### LOAD ERROR IN LINE [n]

Something is wrong with an attempted LOAD from cassette - typically it's you're trying to LOAD has been scrambled somehow. You didn't leave the tape on top of the TV, did you?

# Programming

## Error messages and what they mean

There's not much you can do about this, except try again, and if it persists, put it down to experience - and take more backup copies in future.

### NEXT WITHOUT FOR ERROR IN LINE [n]

The computer has found a "NEXT" statement in your program that is not associated with a preceding "FOR". You might have missed out the FOR all together, or a NEXT somewhere else in the program might have been held to your FOR - that can happen if you aren't specific about which FOR variable you want executed NEXT. Check that your FORs and NEXTs pair off!

### NOT INPUT FILE

You've OPENed a tape file for output only and you're now trying to read from it. Check your READ# command, but the fault is more likely to be in an OPEN if the third parameter of the OPEN statement isn't '1' or omitted altogether, you have opened a write-only file.

### NOT OUTPUT FILE

A tape file has been OPENed for input only and you're now trying to write to it. Again, check your READ# command, but as above the fault is more likely to be an OPEN - if the third parameter of the OPEN statement isn't '1' or '2' you have opened a read-only file.

### OUT OF DATA ERROR IN LINE [n]

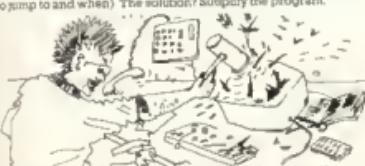
The computer has run out of DATA items to READ - there must be enough entries in your DATA lines to fill all the variables in READ statements. The simplest solution is to start counting and make sure there is sufficient DATA.

You might also get the problem if you want to read the same DATA more than once - to repeat it in different FOR locations or different arrays, say. Then you need a RESTORE before attempting each READ.

### OUT OF MEMORY ERROR

You may have run out of memory because your program is too big and/or it's creating too many new values for variables. Buy more memory, simplify the program, or stop it producing so many new values for the computer to store.

You might also get this error even when PRINT #EOF() shows you have a lot of memory left. In this case what's probably happening is that the stack is filling up with too many nested GOSUBs or FOR - NEXT loops (the stack is an aide memoire for the computer that indicates where in the program it has to jump to when). The solution? Simplify the program.



This can also occur when loading a program from tape. If the tape header is corrupt then it can overwrite part of the Operating System area and cause a spurious error message. Always turn off the computer before attempting to load if this occurs!

### OVERFLOW ERROR IN LINE [n]

You have a calculation that produced a number too big for the computer (the largest number the Vic or 64 can handle is  $1.0141894 \times 10^9$ , or 170141894 + 36 as it's sometimes written, either way it's the number multiplied by 10 followed by 36 zeros). You will have to alter the program to avoid this, perhaps by changing the order in which your calculations are done. Do you really need numbers that big?

### REDIM'D ARRAY ERROR IN LINE [n]

The same array name has been used in more than one DIM statement, or you are trying to DIM an array name to which you've already allocated a particular number of elements. This is likely to be the result of carelessness, for instance have you got a DIM statement within a FOR - NEXT loop?

It helps to keep all your DIMs at the start of the program, that way they're much easier to check.



### REDO FROM START

Sounds awful but isn't. It just means the wrong kind of response has been given to an INPUT prompt - the program was expecting numeric and some other type of alphabetic, or vice versa. The message will continue to appear until the computer gets the right input.

### RETURN WITHOUT GOSUB

The computer has found a RETURN that isn't linked to a preceding GOSUB - perhaps because you missed out the GOSUB or inadvertently added a RE TURN (in which case you can add or delete as appropriate), but more likely because the sequence of execution caused the program to fall into a subroutine. In this case, correct the program now: a STOP inserted before the subroutine might help you find out why it's happening.

An END there should prevent the program running on into the subroutine, a GOTO could skip past it.

### STRING TOO LONG ERROR IN LINE [n]

You have too many characters in a string, the maximum allowed is 255. This may have happened because you tried to add two strings together, or there's any danger of a concatenation producing an over-long string. It's worth inserting a test for length via the LEN\$ function.

### SYNTAX ERROR

You have used an illegal word or construction. The probable cause is misspelling - common culprits are bad spelling, accidentally hitting one character twice while typing, and too many or too few brackets. Check your program lines. And get into the habit of using keyword abbreviations - fewer keystrokes to get wrong.

### TYPE MISMATCH ERROR IN LINE [n]

Your program has tried to put the wrong type of value into a variable - string characters into a numeric variable or vice versa. Change the erring command.

### UNDEF'D FUNCTION ERROR IN LINE [n]

The program is trying to use a function that you haven't defined by a DEF FN statement. Define your function (and it helps to put all your DEF FN's at the start of your program).

Sometimes this error happens because you weren't actually attempting to reference a user-defined function, you've just mistyped something that the computer has detected as a function.

### UNDEF'D STATEMENT ERROR IN LINE [n]

You tried to RUN or GOTO or GOSUB a line number that doesn't exist. The target line has been omitted or you got the number wrong.

### VERIFY ERROR

The program you're verifying doesn't match what's in memory. There are many possible reasons for this, the best option is to SAVE it again and have another go at VERIFYING. If you are still getting a VERIFY ERROR on cassette, move the tape unit (it might be too near a magnetic field like that generated by the TV set) and/or try a different cassette.

# Business Programs

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And they cost—not £300 like so many do—but just £30 each, on disk. If you already load programs by cassette, then they are also available in that format for just £20 each.

At such low cost, you might think they're too cheap to be much good, and probably don't work too well either! Well, they *do* work and we *guarantee* them to work. You'll be delighted with them, as thousands are already.

Go along to your local Commodore dealer and ask to see a demonstration of any of them. See for yourself whether they'll do all the routine chores of your office paperwork and how much time and money they will save you and your staff.

Then you'll be convinced that it's true that they're good!

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Software For All Business Programs are widely available at all reputable Commodore Dealers throughout the country. But if you have any difficulty obtaining them, please contact us direct and we'll be pleased to advise you.

James

## Our regular round-up of games reviews

We get to see a lot of games here at Commodore User, so many in fact that we can't handle all the reviewing ourselves - we farm out some of them, which is why our reviews have someone's initials at the end of them. We look at everything we get, but we don't necessarily print all the reviews we write: instead, we tend to stick with (a) all the best games we come across and (b) those games that you're most likely to find in the shops or the mail order ads.



**BLACK SQUID**  
Vic 20 (3K)  
Joystick only  
Price £6.95

Your shipwrecked men have to brave the unknown waters to escape the dangers of the deep.

You have to get five men to the island in the shortest possible time which isn't so easy, for in the sea are hidden rocks which cut you to shreds if you touch them (there is a way round this if you press the Commodore and shift key you can see the rocks). And there is the dreaded Black Squid which relentlessly comes after you with the single intent to devour your head or feet first. When you reach higher stages you also meet up with the giant clams.

Black Squid is a very boring and difficult game to play. Trying to out swim the squid is near impossible because your men move so slowly, especially when changing direction. The graphics are reasonable but the sound is poor - a bloop-bloop noise for the chasing squid but your players make no noise at all.

On the whole a poor program



**CENTIPEDE**  
Vic 20 (Unexpanded)  
Joystick only  
Price £15.99

This like Defender is an original Atari game now rewritten for the Vic 20.

In Centipede you are in a forest of mushrooms and you have to destroy the centipedes before it can reach you, it's not as easy as that may seem.

The centipede zig-zags down the screen toward you bouncing off the mushrooms. You have a bug-blaster (just happens to look like an upside down mushroom) that is able to move up, down, left and right. Shooting mushrooms gives you a clearer shot at the centipede, but each segment of the centipede that gets hit turns into a mushroom - which sometimes results in the untimely change in direction of the rest of the centipede, so be careful when it's just above you.

There are other dangers in the forest - spiders which bounce around the screen eating mushrooms and your bug blaster, the scorpion which scurries across the screen poisoning the mushrooms (and when the centipede touches a poison mushroom it goes insane and makes a frenzied dash for the bottom of the screen); and the flea. Not as spectacular as the other two: he just drifts to the bottom of the

screen leaving a trail of mushrooms behind him. To destroy it you must shoot him more than once or he can destroy your bug blaster.

All round, centipede is a good one or two player game with well-defined graphics and good clear sound. Atari's cartridge based software for the Vic is a good idea and I am sure it will take off.

Atarisoft

Presentation:    
Skill level:    
Interest:    
Value for money:

**CHOPPER**  
Vic 20 (Unexpanded)  
Joystick or Keyboard  
Price £5.99

Chopper must be one of the worst games I have ever come across. The spectacular cassette insert is very misleading, with such colour ful art you might expect the game to look something like it.

The so-called hi-res graphics are basic, with black figures representing a guided missile launcher, vans, trucks, tanks and the chopper. The only colour is in the ground surface and the underground missile base from where you are being constantly fired at.

As the chopper pilot you have to bomb the passing vehicles while

avoiding the enemy barrage (from the undestroyable underground base) and the guided missile (which is near impossible to outfly because it flies as fast as you and your direction change is too slow).

The game is not enjoyable at all because you can not move and fire at the same time. Poor sound, too.

Sumlock Software

Presentation:    
Skill level:    
Interest:    
Value for money:



**DEFENDER**  
Vic 20 (Unexpanded)  
Joystick only  
Price £15.99

This the original Atari Defender, is a zap-zap game in which you are armed with three fighter ships and three smart bombs. Your task is to prevent the alien landers from taking your humans. But it's not all that simple, because the landers do not come alone - they have an assortment of fiendish alien baddies such as Pods, Bombers and Baiters. The most lethal of these are the Pods: once one has been destroyed it releases 'Swarmers' which ruthlessly track you through space with the single-minded intention of destroying you.

The Baiters only appear after a certain time. These sucker-type

Channel 8

Presentation:    
Skill level:    
Interest:    
Value for money:

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craft follow directly behind you moving at a blinding speed and constantly firing; you'll need some good manoeuvrism to destroy those ships. But you should always take care in dashing through space in case you come across a bomber laying its mines across your path - they are still alive once it has been destroyed.

Defender is a fast-moving and enjoyable one or two-player game. Well-defined graphics and good-quality sound make full use of the Vic's limited memory, and it's on cartridge too.

The main hitch with Defender is that it sometimes puts you on to the next screen arbitrarily, but who really minds extra points and more lives?

Atarisoft

Presentation:	■■■■
Skills level:	■■■
Interest:	■■■■
Value for money:	■■■■



### DESTROYER

Vic 20 (Unexpanded)  
Keyboard only  
Price £5.99

Destroyer is another game from Sumlock but it should not be tarred with the same brush as Chopper this is a far better game.

You are the skipper of the destroyer HMS Victory. Your mission is to destroy the enemy subs in the area, though you are constantly under attack from mines and enemy aircraft. The Victory is

armed with an endless supply of depth charges and two anti-aircraft guns.

The keyboard controls I found on this game give good control, especially when it comes to shooting down enemy fighters. The radar scanner tells you the direction they are coming from so you know which direction to shoot at. But watch out for bombs! You should always be on the lookout too for the mines which float from the bottom of the screen and constantly cause you to change direction. Once you have past the mine line you go on to the next screen and the speed of the game increases and so do the number of mines and bombs.

The graphics are pretty crude, the sound and colours not all the bad. But I'm sure that Sumlock could have at least disabled the Commodore and shaft key.

Sumlock Software

Presentation:	■■■■
Skills level:	■■■
Interest:	■■■■
Value for money:	■■■■

### HELL GATE

Vic 20 (+8 or 16K)  
Joystick only  
Price £6.00

Hell Gate is the oddest zap game I have ever seen in a long time.

You have become the guard of the Gate which at some point in time will be rampant with alien droids whose mission is to destroy your home planet earth.

You are equipped with four lasers mounted on each side of the Gate, your task is to blast the droids as they materialise in the gate when they hyper-jump through space. Not an easy task, because there are so many of them, that's why you have four blasters. You also have 'smart' bombs three for every wave. They are activated whenever an alien hits your blasters, once all your plasmaguns are gone you have three lives left.

Hell Gate has up to 20 levels of play you can select your own level from 1-8, the rest of them you have to reach with skill. When you reach higher levels you will see tappers, they change colour and on timing them you release a deadly bolt that destroys anything in its path, including your blasters, so beware.

The Hi Res graphics and sound is very good with some spectacular array of alien forms in various colours I have never seen. Quite a good game for the zap freak, as you'll

expect from this marque  
Lamason?

**Presentation:**       
**Skill level:**       
**Interest:**       
**Value for money:**



**JUMPIN JACK**  
Vic 20 (Unexpanded)  
Joystick or keyboard  
Price £5.50

Another spinoff of that arcade favouiture Frogger. In this Jack has been out for a night on the lily ponds (tiles), it's now daylight and Jack has to get back home for a good day's rest. But the traffic is roaring across the road, and the river currents are flowing strongly, and would easily drown any frog that dared to cross it.

Your job is to guide a wary Jack across to his home in one piece. First you have to get him across a three-lane motorway, then you have to negotiate the hazardous river. But help is at hand; you are aided by these white blocks with star growths (head, tail and legs) which form the turtle. There are also logs which you can hop on to as they float by until you reach home. Once you have seen Jack safely across five times you go on to the next screen and it gets harder; the cars move faster, the logs get shorter, there are fewer turtles to help you.

The graphics are fair, but the sound and movements leave a lot to be desired. The movements of Jack and the other moving parts are very jerky; the sound - well, it plays this silly tune throughout the game which drove me to despair. On the whole a fair game, but nothing to write home about. **8/10**  
Sunrock Software

**Presentation:**     
**Skill level:**       
**Interest:**       
**Value for money:**

### NOTE INVADERS

Vic 20 (any)  
Keyboard  
Price £5.25

Note Invaders is an excellent way to learn the notes on the musical staff (the five lines on which music is written). It's presented as a game; these lines are produced on the screen along with particular notes which must be learned before being zapped out by the menacing 'invaders'.

There are three levels of difficulty and either treble or bass clefs can be chosen. Keyboard operation is simplicity itself, in that keys A to G represent those notes displayed on the screen. As you get faster and more accurate, the staff itself gets shorter; so you really have to know your note names well to get a high score.

Four programs are included on this cassette, at least two of which I found particularly useful in my own attempts to learn musical notes. Note Invaders should appeal to all ages - in fact anyone contemplating learning music or perhaps an instrument. **CB**

Chalksoft

**Presentation:**       
**Skill level:**       
**Interest:**       
**Value for money:**

### THE CATCH

Vic 20 (Unexpanded)  
Joystick or keyboard  
Price, £3.99

If and when I acquire the necessary expertise, the two simple but neat effects employed on the title screen will be incorporated into my own magnificent programs. But enough of daydreams - what about the game?

Stepmatic in concept but effective in execution, a blue saucer is dropping bombs in a quasi predictable fashion. By moving your shield in an intelligent manner, the city - which is scrolling by beneath you - can be protected.

Subsequent to the interception of a predetermined number of pods, the border changes colour and the pace quickens. The sonics are acceptable but a bit primitive, the yellow screen is at least a change from the usual black 'space sky'.

Most arcade aficionados with an unexpanded machine could find this a worthwhile bet, espe-



**BC BASIC** At last the ultimate has arrived - a complete 9k extension in a ROM pack. Over 97 new or modified commands and functions have been added and because they have not been fully tokenised, the speed of operation is not affected. Abbreviations may also be used. The main areas of enhancement are

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# Games

## SCREEN GONE

call if competing against a friend.  
Bubble Bus

LS

Presentation: **\*\*\*\***  
Skill level: **\*\*\*\***  
Interest: **\*\*\*\***  
Value for money: **\*\*\*\***



*the catch*

Programmed and designed by  
Felix and Michael Clegg  
Falling Skies Software Ltd  
10, Westfield Close, Tickhill,  
Doncaster, DN11 9LA. Tel: (0302) 744129.

**SWORD OF HRAKEL**  
Vic +3K  
Keyboard only  
Price £5.99

Another Rocomik text adventure one for the long winter evenings, I think. Your village has been depopulated by the curse of the evil Mage, you must find and kill the Mage to lift the curse and return your people. Has save game option. Programmer has sense of humour too, I mean what would you do with an agitated duck? Save your answers for the game! JDC

Presentation: **\*\*\***  
Skill level: **\*\*\*\*\***  
Interest: **\*\*\*\***  
Value for money: **\*\*\*\***

**XENO II**  
Vic 20 (+16K)  
Joystick only Price £7.95

Anurog has a veritable library of

16K games. This is an early one, an epic in four screens. Screen one, in which you hopefully land on the planet Xeno II, is the most attractive. Your part-coloured (in common parlance, half and half) red and blue craft has to dodge cyan asteroids (solid ones not sketchy outlines) and delicately alight on the landing pad.

Up to part two three waves of homing mines to ward off, with a bivel colour display for each successive Space Invader-like follower; personally the aliens didn't appear menacing enough for my tastes, looking rather "dumpy". Having succeeded (after many tries) in reaching the last screen you will be faced with a monumental task. To successfully blast a way through the force field and smash the power source, shots must be directed past blockading guardians whilst avoiding the bombs released by another helpful bunch. You will certainly require practice and a fair measure of skill to triumph in the game.

The sound effects are adequate and the program will certainly give you a good work-out. LS

Anurog Software

Presentation: **\*\*\***  
Skill level: **\*\*\*\***  
Interest: **\*\*\*\***  
Value for money: **\*\*\*\***

**ZORGON'S KINGDOM**

Vic 20 (+3K)  
Keyboard or Joystick  
Price £6.99

Not what I would call a "graphic adventure", more a Kong-type game where you must get through five arcade-style screens in order to destroy the evil Zorgon. Each scenario is different, though and it's quite a challenge overall. The graphics are quite good though the scenarios are only moderate. More difficult than it seems at first. JDC

Rocomik Software

Presentation: **\*\*\***  
Skill level: **\*\*\***  
Interest: **\*\*\***  
Value for money: **\*\*\***

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# How to type in Victuals

## How we reproduce listings

We usually put our listings for Victuals and other programs through a code conversion program that replaces the hieroglyphic Commodore colour and screen control symbols with a more meaningful set of commands

When you see... It means... And you...

[CUP]	cursor up	press the 'cursor up' key (shifted)
[CUD]	cursor down	press the 'cursor down' key
[CUL]	cursor left	press the 'cursor left' key (shifted)
[CUR]	cursor right	press the 'cursor right' key
[BOM]	cursor to the top left-hand corner	press the HOME key
[CLR]	clear	press the CLR key (shifted)
[INS]	insert	press the INS key (shifted)
[BLK]	change to black	press the BLK key (CTRL and 1)
[WHT]	change to white	press the WHT key (CTRL and 2)
[RED]	change to red	press the RED key (CTRL and 3)
[CYN]	change to cyan	press the CYN key (CTRL and 4)
[PUR]	change to purple	press the PUR key (CTRL and 5)
[GRN]	change to green	press the GRN key (CTRL and 6)
[BLU]	change to blue	press the BLU key (CTRL and 7)
[TEL]	change to yellow	press the TEL key (CTRL and 8)
[RVS]	reverse on	press the RVS ON key (CTRL and 9)
[RVO]	reverse off	press the RVS OFF key (CTRL and 0)
[SPC]	space	press the space bar; repeat the specified number of times

We have two methods of presenting listings. When we can, we run them through a converter program that replaces the hieroglyphic control codes with more meaningful symbols

These listings we generally run out on a letter-quality printer though, and conventional graphics can't be handled on a daisywheel. So some listings are done on a Commodore printer, in which case you may see the standard control codes



Virtual

## Scrap Yard

by A. Veryard.

Scrap Yard is one of the more original and unusual Virtual offerings we've seen. It runs on the unexpanded Vic and loads in two parts. The first part just lists the simple instructions. But you must load and run it, and it runs stop/restore before leading the second part. That gives you the main body of the program.

The idea is nice and simple you are the operator of a crane which you use to pick up various pieces of junk from the assorted scrap at the left side of the screen. Pressing the space bar stops the crane above the object you've chosen. The crane picks it up and moves back automatically. You've then got to hit the space bar again to make the crane deposit the piece of scrap on the appropriate pile. There are four different kinds of rubbish, each with a different point value. If you fail, the junk you've already collected literally walks out at the bottom of the screen - and you start all over again.

The program shows good use of vertical scrolling and there are some nice sound and colour effects too - so go and pick up some rubbish.

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 519 POKE 14H.8  
 520 FOR I=1 TO 22  
 521 FOR J=1 TO 22  
 522 POKE 36876.28  
 523 POKE 14H.8  
 524 POKE 36876.1 INT(RND(1)\*128)+128  
 525 POKE 14H.22.2  
 526 POKE 36406+H.22.2  
 527 FOR I=1 TO 22 NEXT J  
 528 POKE 36876.9  
 529 POKE 14H.22.168  
 530 H=H-2 NEXT J  
 531 FOR I=1 TO 22+1  
 532 POKE 14H.8  
 533 POKE 36876.22.2  
 534 FOR I=1 TO 22+1  
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 1224 FOR GG=1 TO 22+1  
 1225 FOR HH=1 TO 22+1  
 1226 FOR II=1 TO 22+1  
 1227 FOR JJ=1 TO 22+

### Business accounts

Sales Ledger (Anagram) d	75.00
Purchase Ledger (Anagram) d	75.00
Sales Ledger (Ramtop) t	14.50
Purchase Ledger (Ramtop) t	14.50
Cashbook (Microsimplex) d	172.50
Inventory 64 (MMS) d	29.95
Cash Book (Gemini) d,t	99.95
Final Accounts (Gemini) d,t	99.95

### Home accounts

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Budgeteer 64 (Adamsoft) t	8.95
Checkbook Manager (Adamsoft) d	14.95
Home Office (Audiogenic) t	14.95
Home Accounts (Gemini) d	29.95
Home Accounts (Gemini) t	19.95

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Vizawrite 64 (Viza) d	79.95
Vizawrite 64 (Viza) c	89.95
Vizaspell 64 (Viza) d	89.95

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# Commodore 64 Video:

## Part 6: Split screens

by Jim Butterfield

This time we'll look into a fairly advanced technique: split screens on the Commodore 64. It's a new aspect of the computer, combining things we have already learned into a new set of capabilities.

We'll need to venture into more technical waters here ... but with a little effort, we can perform some minor miracles on the Commodore 64 screen. All the limitations we have learned may be set aside with a little creative 'cheating'. We'll have to venture into machine language, but even if you're not a ML tyro, it's worth knowing that the job can be done.

We have learned a number of limitations, largely based on the idea that the screen can do a lot of things, but only one at a time:

We can have only one background colour, unless we are in multi-colour mode; and even in that case, we're restricted to our choice of colours.

We can obtain information only from one 16x memory quadrant. We can only use one character set.

We can be in character mode or bit map (hi-res) mode, but not both.

We may have only eight sprites on the screen at one time.

In fact, we have a more general set of rules. We may be in only one mode at a time - multi-colour is either on or off, extended colour is either on or off, and so on. It seems impossible to mix screen modes and have the best of both worlds - but we can do it.

Here's the trick: The Raster Register address D012 together with the high bit of D011, can do more than tell us where the screen is being painted at this instant. We may store an 'interrupt' value there and tell the computer 'Advertise me when you can get that part of the screen'. And at this point, we can switch screen characteristics, colour mode, high resolution, background colour, character set, memory bank, wherever you want. Of course, we need to put it all back when we return to the top of the screen.

### The Task

We're going to write a quick program to split the screen into two parts, each with a different characteristic. It won't be perfect, we're just trying to show you the technique and not polish up all the loose ends. The fine points will come later. First, let's plan.

If we set a new 'interrupt' into our machine, we'll need to make some careful distinctions. First: when an interrupt happens, we must establish who caused the one? Was it the raster, or the traditional interrupt sources of 1/60 second timing? And second, if it was a raster, which part of the screen is involved - the top or the 'watch' point?

Let's start to lay out the machine language program. All interrupts will come here, and we'll need to sort them out. We'll put the program into the cassette buffer.

033C AD 19 D6 INT LDA \$D019  
033F 25 01 AND #\$01  
0341 F0 18 BREQ REGULAR

The interrupt has happened and come here. Check the Raster Interrupt bit in D019 - was this one caused by the Raster? We'll need to mask out the bit we want to with an AND. If we get nothing, it's a regular interrupt - go there.

0343 BD 19 D6 STA \$D018

It is indeed a raster interrupt, and we must shut off the alarm. We do this by storing the bit back where it came from (there's a 1 in the A register right now). Amazingly,

this turns the bit off.

0346 A2 82 LDX #\$82  
0348 A0 15 LDY #15

We'll prepare the registers assuming we are doing the top-of-screen work. The hex 82 is decimal 130 - the scan line that hits about mid-screen; that's where we will want the next interrupt to take place. Note that hex 82 is considered a 'negative' byte, we'll use this fact just a moment.

Now, let's see if we are correct about being at mid-screen.

034A AD 12 D0 LDA #3D012  
034D A0 04 BPL MID

We look at the raster scan. If it's less than 137, we're near the top of the screen, and we don't see the 'negative' byte. So we stop ahead.

If, however, we are at the middle of the screen, we'll see a 'negative' value. We won't branch. Instead, we'll fix up the registers for mid-screen work:

034F A2 61 LDX #\$61  
0351 A0 12 LDY #12

Both streams join again at this point. X contains the raster

location where we will want the next interrupt: if we're at the top, we want to be interrupted at the middle (hex 82); if we're at the middle, we will want to be interrupted at the top (hex 01). Y contains information on the character set we want to choose graphics or text. Let's proceed.

0353 8E 12 D0 MID STX \$D012

Place the next interrupt point into the raster register. The next interrupt will now hit at the right time.

0356 8C 18 D0 STY \$D019

Places the 'character set' value - hex 15 for graphics, hex 17 for text - into the appropriate register.

0359 4C EC FE JMP \$F0FC

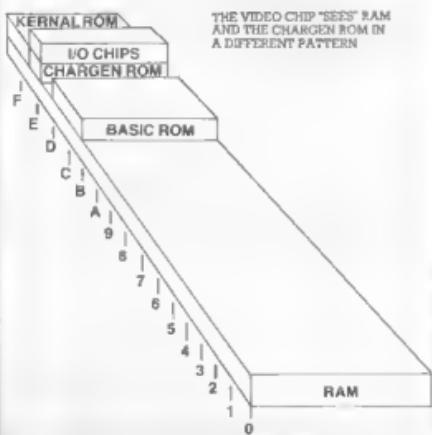
We've done our job. We may now exit. Don't give an RTI - instead, go to a routine that clears things up nicely, at F0FC. And what of our regular interrupt?

035C 4C 31 ER REGULAR JMP \$EAE1

It goes to the normal address ... to which regular interrupts go.

We must have more to do after

### COMMODORE 64 ARCHITECTURE



we get this program into memory. We must also detach the interrupt vector to our new program, and fire up the raster interrupt control.

## Back to Basics

Ready to code all this stuff in Basic? Here we go:

```

50 POKE 53265,27
100 FOR J=628 TO 862:READ X
110 T=7-T:POKE J,X
120 NEXT J
130 IF T<->3826 THEN STOP
200 DATA 173,25,208,41,1,240,
25,141,25,208,162,146,160,21,
173,14
210 DATA 208,16,4,182,1,180,23,
142,18,208,140,24,208,76,108,
234,76,46,234
300 POKE 56333,127
310 POKE 788,60:POKE 788,3
320 POKE 56333,129:POKE
53274,128

```

Let's look at the last three lines. Line 300 kills the interrupt for a moment, so that we can mess with the interrupt vector without running into disaster. Line 310 changes the interrupt vector to point at our newly-poked program. Line 320 restores the interrupt, and adds an extra one the raster interrupt

## Running It

When the program is run, an amazing thing happens: the screen becomes graphic at the top, and text at the bottom. Impossible, you say? Not for us clever (and careful) people. The effect is permanent. You may NEW the program and start something else and the split screen will still be there.

You shouldn't use cassette tape with this program in place - it's there in the buffer. And you may find that LOAD and SAVE don't work quite right. RUN-STOP/ RESTORE will put everything back in its former state.

## The Unsolved Problem

But it's not perfect (I warned you). Every once in a while, the barrier seems to creep slightly and then correct itself. Maybe it's computer hiccups. It seems worse when you are using the keyboard. What's happening? And how can we fix it? Stay tuned ...

## Son of Split Screen

That simple program to split the screen of the Commodore 64 is similar but not identical to this one:

```

90 POKE 53265,27
10 FOR J=628 TO 862:READ X
110 T=7-T:POKE J,X
120 NEXT J
130 IF T<->3826 THEN STOP
200 DATA 173,25,208,41,1,240,
25,141,25,208,162,146,160,6,
173,10
210 DATA 208,16,4,182,1,180,0,
142,18,208,140,24,208,76,108,
234,76,46,234
300 POKE 56333,127
310 POKE 788,60:POKE 788,3
320 POKE 56333,129:POKE
53274,128

```

Our previous example split the screen into two sections: graphics and text. This one splits the screen into two background colour areas. It makes it easier for us to see the glitch that occasionally disturbs our screen split. By the way, it's easier to see the problem when you are using the keyboard.

## Why the problem?

Here's where the problem comes from. The timer interrupt strikes about every 1/60 of a second. The screen display runs at a rate of about 50 times a second in Europe.

The two processes run at similar but not identical speeds. Every once in a while the timer interrupt hits just before the raster interrupt.

The timer interrupt has quite a few jobs to do: update the T13 clock, check the cassette motor, flash the cursor, and check the keyboard. It takes time to do these jobs, and extra time is required if a key is being pressed.

Suppose we have just started on the timer interrupt, and the raster scan says "I'm ready!" Sorry, raster; we're already into an interrupt routine, and other interrupts are locked out until we have finished. By that time, the screen scan might have moved along a few lines ... and our split screen has crept from its normal position.

## Some possible fixes

There are several possible approaches to fixing this raster. The ones that come to mind first are complex, in a moment, we'll move on to an easy one.

When the timer interrupt strikes, we could ask it to look at the raster and see if the scan was close to the interrupt point. If so, we might want things out, or skip part of the timer interrupt jobs. Messy.

The timer interrupt could 'unlock' the interrupt very quickly, using a CLD command. That way,

we could interrupt the interrupt program itself to do the split screen job. Better, but some programmers feel it's dangerous to allow this kind of thing to happen.

But there's an easier way: shut the timer interrupt off completely, and do its various jobs with our own programs. This seems very complex, but it's not. We can call the timer interrupt routines ourselves whenever it's time.

Let's look a little more closely into the timing of these interrupts. We expect to cause a raster scan interrupt about 1/60 times a second. That's twice as often as the timer interrupt needs to be handled. So our raster program could occasionally call in the timer interrupt program.

It seems that we could do the job easily by calling the timer interrupt routines every second raster interrupt. That would certainly do the job ... but there's a better way.

Even though we've shut off the timer interrupt, it's still signalling when the time is ready. Let's review: the timer leaves a signal in its address DROM (66333) whenever it counts down to zero. Normally, this signal triggers the interrupt line (IRQ) and causes the processor to be interrupted. But we may break the connection between the timer signal and the interrupt line. In this case, the timer will not cause an interrupt - but the signal will still flash when the appropriate time has come.

So here's our plan: we will disconnect the timer from interrupt, and service it ourselves whenever it flashes. Easier done than said. Let's look at the machine language coding:

```

0341 A2 62 LDX #862
0342 A0 06 LDY #506

```

Set up for top of screen. Next interrupt, line 02 hex; new colour, number 6.

```

0343 AD 12 D0 LDA $D012
0344 A0 04 RPL MID

```

If it's really the top of screen, we can skip ahead. Otherwise, we change for mid screen - line 1, new colour number 0:

```

0345 A2 01 LDX #801
0346 A0 00 LDY #500

```

Now we're ready to do the job,



wherever the screen is:

```

034E 8E 12 D0 MDM STX $D012
0351 8C 21 D0 AND $D012

```

The job is done. Now let's see if the timer interrupt is calling for action:

```

0354 AD 0D DC LDA $D00D
0357 26 01 AND $D01
0358 F0 03 BEQ SKIP

```

If we don't skip, the timer will continue. Call it on:

```

0359 4C 31 EA JMP $E5A3

```

If we did skip, the timer isn't needed. Quite with:

```

035E 4C BC F4 SKIP JMP $E5C3

```

We must remember, of course, to turn off the timer interrupt, set its I/O vector to our new code, and turn on the raster interrupt. We'll do all that in Basic. Speaking of which

## Basic-ally Yours

... Here's the same program in BASIC:

```

50 POKE 53265,27
100 FOR J=628 TO 862:READ X
110 T=7-T:POKE J,X
120 NEXT J
130 IF T<->3826 THEN STOP
200 DATA 169,1,141,25,208,41,
146,160,6,173,10,208,18,4,
162,1
210 DATA 160,0,142,18,208,16,
33,208,173,13,228
220 DATA 41,1,240,3,76,46,234,
26,188,254
300 POKE 56333,127
310 POKE 788,60:POKE 788,3
320 POKE 56333,129:POKE
53274,128

```

Now we have a rock solid colour change at the appropriate screen point. No creeping, no jerking, no lags.

## Summary

We've only touched upon the techniques of raster interrupt. A whole host of new possibilities open up with its use.

But we've shown it can be done ... and some of the techniques that can be used to do it.

# More on sprites.

The sprite that we drew in (February issue) wasn't very big. Here's a way to make it larger in the X and Y directions with addresses 53277 and 53286 respectively. The addresses are often used - when an object moves - to see if it looks closer and we then we can effect it from all animations. Try using the `POKE 53277,11` and `POKE 53286,11`.

## Colouring

One sprite is one colour only - the colour we selected in 53287. The other colour is 'transparent', so it isn't really a colour at all. We may code one sprite in four colours (or three plus transparent, to be exact) but we would need to draw it slightly differently.

Instead of one bit representing either 'colour' or 'transparent' a grouping of two bits will be needed to describe four conditions - the sprite colour (as before), special colour no. 1, special colour no. 2, and transparent. These extra special colours by the way are kept at 53288 and 53289. They are the same for all sprites, only the sprite colour is individual.

Now we come to the last two registers, which tell you about collisions. `PEEK(53279)` will tell you if any sprites have collided with the background since you last checked. It certainly has, of course if you've been meandering around with the screen as suggested.

`PRINT PEEK(53279)` will yield a value of one. Checking the bit table above tells us that sprite zero

has hit the background. Now checking this location clears 0 but if the sprite is still touching some of the screen text, it will flip right back on again. Move the sprite to a clear part of the screen. `PRINT the PEEK again` it will likely still say 1, since the sprite has hit characters since it was last checked. If the sprite is safely in a clear screen area, the next `PEEK` will yield a zero.

We've only activated one sprite so that we won't see any signs of collision between sprites. You would see that in location 53278 but right now `PEEK(53278)` will yield zero - unless you have activated more sprites then would not have been any collisions. Again, when you get a signal here, you'll know which sprites have bumped, and setting the location clears it, so that only new 'touches

will be shown on the next test.

A small comment: these two `PEEK` locations are marked `interrup`. Yet when such collisions occur, they are logged but they don't do anything. Now the word 'interrupt' has a special meaning to machine language programmers, and no interrupt seems to be happening. The machine-code programmer who wants interrupts to happen must enable the interrupt by storing the appropriate value into address D010 hexadecimally, and then write the appropriate extra coding to make it all work.

This completes our roster of registers, but the plain mechanical facts don't convey the remarkable things that you can do with the Commodore 64. There's more to come.

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Bailiff also has a practice option (you select the words you want to study, and work through them without playing the game), an analysis of mistakes; and a survey of words in each section.

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Age guide 13+

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## ENGLISH

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making you use words differently. Start with one of the two games—'Lines' is easier than 'Shooting', and then when you are sure you know the words, get the spelling right with the writing option.

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### JUST A MOT

Age guide 13 to adult

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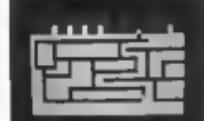
which are either plain wrong or so peculiar that no French person would ever use them! Our programs are vetted meticulously by native French speakers. Just a Mot provides an excellent vocabulary for holiday or business travel, for students or for people who just want to brush up their half-forgotten French.

## HISTORY

### TIME TRAVELLER

Age guide 7 to adult

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# Assembler

may not be necessary for large source programs. It is a credit to Mikro that it allows you to enter source code directly or disk or tape. It also assembles into RAM, disk or cassettes. You can run ASM in works mode off the function keys. It starts an assembly by asking you for the filenames. This is double purpose if you have the file on disk or tape. If you suffix you add `ASM` to where to get the file and where to send the source code and:

... parts of mode 1, 2, 3 and three are many others used. The latter are where the source code from - it can be `MEM` for bulk storage devices (disk or cassettes), `Memory`, `Keyboard`, and `User-written` devices.

That last one would allow you to use any fancy storage devices you get running on your machine. (What's the disk? Micro-disk?) but you'll have to write your own input and output routines. It's certainly not a task for a beginner.

The second character indicates where the assembler listing goes, the third specifies the destination of the machine code. The same input options apply, but in this you can send to the monitor, `P`, or discard completely (`D`).

With a source file name like `PROC.M2M` the assembler will pick up the file `PROC.SRC` from disk or cassette whichever you specified when you brought the system, but the assembly on the screen appears the machine code `PROC.M2M` name like `PROC.M2M`

will assemble from RAM without listing and put the code back into memory.

This is about the best way of producing code. It's fairly quick - I did a large program (about 5K in size) in about 35 seconds with code and 35 seconds with code. It is just a little slower when not producing code.

If the code is assembled to disk or tape it is sent out in hex format (immodes assemblers do the same). It must be reloaded as machine-code and then output.

The other functions examine disk, erase disk, read as well as loading text, saving files, saving machine code and exiting. You have an option to load, to get from the assembler to the editor or press F5 (execute machine code) and enter either `W` (cold start - wipes all text) or `W002` (warm start - preserves existing text). I didn't like the aspect of Oricism, that should be a better linkage between the two programs, perhaps allowing the assembler to pick up the read address when you assemble from disk.

Once you have entered the values it needs (where the source starts, where the symbol table should be built), these are retained as a default and used subsequently if you just press return.

A wide range of directives and pseudo-ops are available, so that you can control the format of assembly listings and link to source files if they won't all fit in memory at the same time. Apart from my complaints

about the search and replace facilities, I can only recommend Mikro to anyone who wants to write assembly programs. The significant omission is the ability to relocate machine code to a different address. At about £26 it is good value for a professional product.

## Mikro

At £26.75 Mikro is nearly three times the price of Oricasm. But if you want the facility of a cartridge assembly, it works with Basic. It is certainly worth a look. The Vic version is not just an assembler; it also has commands for graphics, sounds. These have been added in the 64 version, making it a machine-code and assembly system.

Unless you have a motherboard the Vic version gives you only 3K to play with, so if you're left with 3087 when you switch on.

Mikro works at Basic level, so remember the source programs will use the same as emulating Basic programs. You can write and run Basic programs with Mikro plugged in, but you cannot run Basic or source programs. In a typical chunk of source code looks like this:

```
4400 STA CM2 6161
4410 BNE NONE
4420 JBE CHECK : CHECK
4430 HORIZONTAL MOVE
4430 HNE DONE
4440 LDA E0
4450 STA MTAB+1 HLT UP DIRECTION
4460 LDA A1 VERTICALLY
        US
```

**4470 STA** **511 ALSO**  
**4480 INC A RT3**

If you want to change a value you can simply list the section and change it you would with a basic program. All basic assembly work is

apart from the memory you'd hardly notice that Mikro was there like to keep it plugged permanently, but it gains which makes it in. I wrote a program which also has a

several commands provided which make life a lot easier. For instance `FORMAT` will switch to LIST but the layout comes out very nicely lined up in columns. So `FORMAT` 4480 would produce

**4450 STA MTAB+1 ! SET-UP DIRECTION**  
**4460 STA E1 ! VERTICAL**  
**4470 STA MTAB ! ALSO 1**

**4480 DONE 500**

Programs can also be listed to the monitor by doing an `OPEN`, `READ` and `FORMAT`. A Centronics parallel printer interface is in (programmed in software), you can plug a serial cable directly onto the user port as device 1. It can be used full-time with `OPEN`, `READ` and

**OPEN 1,4** Very nice indeed. `DELETE` is a much-needed command which removes lines of programs and I think there's a bug in it if you delete from the end of the program. (`DELETE 4480` - say) this seems to corrupt the end of the program.



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# Assemblers

The solution is to specify a range of lines instead.

There is also a known bug in the current version (no 3) of Mikro - if you enter a line including px (shifted up-arrow) the machine jumps into TIM - the machine code monitor - and crashes. Once it locked up my machine went off and I had to switch off.

Other commands are AUTO, which displays line numbers when you are entering the program, and NUMBER, which shows any number (0 to 65535) in decimal, hexadecimal, octal (who uses that nowadays?) and binary. You can type in NUMBER \$A000 and this will show

```
$A000 40960 @120000
%10100000
000000
```

All commands can be shortened like normal Basic commands (F shift O for FORMAT, A shift S for ASSEMBLE, and so on).

TIM is an extended version of the machine-code monitor which most PCs come with. It has commands for searching, moving and disassembling machine-code programs as well as entering, moving and loading them. If a BRK instruction is ever executed, then TIM is also entered (try SYS 2).

Of the extra commands the most useful is DISASSEMBLE, this has also been provided as a Basic command. Type 'D Shift 1 \$E455-' and it disassembles from \$E455 onwards, stopping after every page until you hit space or run-stop.

The most important part of Mikro is of course the assembler - and it is quick. One utility program I have is 19K long: Mikro assembles this into 2300 bytes of machine code in 14 seconds.

The assembler works in three passes, first checking syntax and labels and then producing machine code. It generates the code very cleanly by writing it into the RAM beneath the kernel ROMs and I/O chips; when complete the code is copied onto your specified area. In this way all 64K of memory in the machine can be used.

The symbol table which holds all labels can be up to 12K long and is partly stored under the Basic ROM. It would be a very unusual program, perhaps one in several linked parts, which would overflow this - the capacity is approximately 1500 labels of six characters each.

(Osirisan can assemble into the

ROM as this will go into the RAM beneath, but you have to use the normal RAM for the symbol table and don't go near the I/O page or a crash will swiftly follow.)

The LNK command allows one source program to chain another on the end of it. This would permit very large sources to be assembled in one go - perhaps as much as 100K. But it would be very slow with three loads of each program (one per pass).

The assembler mnemonics are standard 6502 format: The usual BYT, WOR and TXT pseudo-ops allow tables of values or strings to be set up in RAM. BYT however is a little restrictive as you cannot mix long text strings with numbers on one line. A line like 'BYT 45, "HELLO", \$1D' (which Osirisan and Commodore allow in their assemblers) has to be split over three lines:

```
BYT 45
TXT "HELLO"
BYT $1D
```

Or else you could use the equally clumsy 'BYT 45, "H,E,L,L,O,\$1D'; it would be useful if Mikro would allow a mixed line.

Only one error is detected when assembling. So if you type in a large source with a few syntax errors, it will take a little bit of time to identify and remove them all. The error messages are given as in Basic, and you can immediately fix and correct the offending line.

After a successful assembly the TABLE command will list out all the symbols and their values in alphabetical order. It is intelligent enough to output these in four columns if you do a CMD to list it on a printer.

There are some annoying omissions in Mikro, and those you'll have to rectify yourself. Renumbering is vital if you are moving or inserting new lines and is not very difficult to program as only two bytes have to be changed in each line. It should have been included as a command. Search and replace are not included either, though the FIND command will locate and list all the lines for any string you specify.

Being able to have multiple statements on a line would be a good way of getting much more text into the limited 30K memory. There is an overhead of five bytes per line, so '10 TTY' takes eight bytes rather than four (three characters plus terminator).



I had to write a small package to supply renumber and disk commands as Commodore's DOS wedge stops Mikro correctly assembling. But I've been using Mikro for several months now and it is my favourite (over Osirisan) by just a whisker.

Mikro is not cheap when

compared with Osirisan or even Commodore's own Assembler Development package (\$25.00); and it cannot assemble to disk or cassette. Its main advantage is speed and convenience - there is no need to switch about with separate editors and assemblers.

Under review	UF 6502
Description:	Assembly language for Vic
Supplier:	(mail order from) Syd Pidd
Address:	Alms, York YO62 2LQ
Summary:	Interesting idea, but desperately needs better presentation
Price:	£12

Under review	Osirisan
Description:	Editor and Assembler for Vic +8K
Supplier:	or 64
Address:	Elmhurst Enterprises
Telephone:	99 Porchester Road
Summary:	Hucclecote
Price:	Gloucester

Under review	Mikro
Description:	Editor and Assembler on cartridge
Supplier:	for 64
Address:	Supersoft
Telephone:	Winchester House
Summary:	Canning Road
Price:	Watford



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BRIDGEC 1 (001.00-011.00) - Fall because of m/s m/s  
BRIDGEC 3 (001) - Very good. It needed all above  
CAUSE REPORT APPEARS (01.00-011) (22-page, 111 lines)  
CAUSE REPORT APPEARS (001.00-011) (22-page, 111 lines)  
EASTFLIP (01.00-011) - Sudden lateral roll over  
EASTFLIP (01.00-011) - Sudden lateral roll over  
MULTIFLIP (01.00-011) - Sudden lateral roll over  
MULTIFLIP (01.01-011.00) - Oversteering loss of control TC  
COMINGC (01.01-011) - Seaweed because seaweed  
PRACTIC CAVE 31 (001.00-011.00) - Seaweed value seaweed  
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# Word processing round-up

## The best and the rest

by Chris Durham



There is no doubt that most micro computer manufacturers would like you to believe that their computers will be all you need, together with a printer and a suitable bit of software, to produce professional looking documents and letters, with little or no effort. The very thing every small business has been looking for just what you need for all those letters you currently slave over a typewriter to produce.

Commodore is no exception to this. Many of its ads depict a businessman moving from office to home using his trusty CBM 64 for everything from WP to games.

Just how sensible is this? Can the CBM 64 really be as good as a dedicated word processor system costing over two or three thousand pounds?

Or can the under-£100 WP programs available for the 64 compare with the £300-plus packages sold to users of £2,000 business micros?

The simple answer is - maybe! It really all depends what you want to do with your word processor.

### What is a word processor?

In its very simplest form a word processor is a program that can input, amend and print text. You aren't confined to producing the final version as you go which is the main difference between WP and a typewriter: you can edit, chop and change more and recall your text before you commit it to the final printed form. And that should all be done in

a manner which is easy for the user to use and understand.

Input and output are fairly straightforward operations for the software; it is the editing part of a WP program that can let it down badly. Few people are perfect typists and one of the great joys and advantages of word processing is that it allows you to correct errors quickly without having to retype the whole document all over again. But all the virtues of word processing count for nothing if the editing procedures are so difficult to use that they can't deal with simple errors without the sort of manipulation which would put Paul Daniels to shame!

The basic editing requirements in any WP operation are

- overtype simple character errors
- insert or delete single characters
- insert or delete multiple characters
- insert or delete whole lines of text

With these basic capabilities you can carry out most editing tasks. The majority of word processors however have considerably more facilities than these. Other common functions you can expect are

- move whole blocks of text to a different place in the document
- copy whole blocks of text to another part of the document, leaving the original unchanged
- find the first (and subsequent) occurrences of a word or phrase
- replace any or all (or selected) occurrences of a word or

### phrase by different text

These begin to open up the real advantages of a word processor, whole paragraphs can be moved about in the document, phrases can be jiggled until they look correct, changes to standard letters can be made quickly and easily.

Combine these features with a choice of output formats, facilities to allow documents to be saved or reloaded on disk or tape, options to allow all the features of your printer to be used, and the ability to print standard letters with different inserts and addresses in each one, then you have a word processor which is capable of doing most jobs you are likely to want.

It may surprise some people to learn that programs are available that allow the CBM 64 to do all these - and more!

### Word processing on the 64

Compared to many home microcomputers, the CBM 64 has many features which make it a good machine for WP. It has a superb full-sized keyboard with a good 'feel'. It has a number of control and function keys - which can be used to simplify WP commands. It has a built-in full screen editor that also facilitates amendments. It has sound to warn you about mistakes or potentially dangerous edits. And it has all that colour to improve the legibility of text.

Sadly not all WP programs take advantage of these. Programs written specifically for the 64 (or - with some

reservations - conversions from other Commodore machines) therefore tend to be a better choice than those word processors originally written to cover a wide range of computers.

One thing prevents the CBM 64 from being an ideal word processor: the maximum of 40 characters per line on the screen. All commercial WP systems have an 80-column display, allowing much more of the document to be seen at once - and corresponding more closely to the length of line that you want on the typical printed document.

There are ways of getting round the problem and designers of WP packages for the 64 have used them all. First the program can accept the text in 40 columns, then reformat it when the document is printed, thus we can summarise as 'format on printing'.

Alternatively the package can make the document the full width required and use the screen as a 'window' that can be scrolled across the text (format as you type).

And third, you can use a hardware converter to display the full 80 columns on a monochrome monitor.

These methods all have their drawbacks - even if it's only a matter of cost, as with the hardware adapter approach. The other two are more commonly used, and the choice comes down to personal preference. I much prefer the 'format as you type' approach, other people prefer to see all the text on the screen at once.

available in the 64

### Program PAPERCLIP

Format disk

Price £98.90

Summary: Wealth of facilities including column manipulation addition and subtraction, sorting - probably the most comprehensive WP available for the 64. Excellent printer options. Good manual. Formats on printing but option for horizontal scaling for column work etc.

Supplier Kobre Micro Marketing

Address PO Box 28  
Ealing-on-Thames  
Oxfordshire RG5 1PT  
Phone 0491 572512

Value for money 0.5

Reviewed March 1984

### Program THE WORD

Format disk

Price £225.25 (includes Video Pak 80 and other software)

Summary: Paperclip on an 80-column screen - comments on Paperclip apply equally to this version. Format isn't only on printing although you can preview 80-column documents on screen.

Supplier Impex Designs (UK) Ltd

Address Metre House  
Second Way  
Wensley  
Middlesex HA5 0TY  
Phone 01-900 0999

Value for money n/a

Reviewed coming in July

### Program WORD-MANAGER

Format disk (80-col)  
case (40-col)

Price £142.00 (disk,  
includes 00-col  
board), £19.95  
(case)

Summary: Comes free with Impex Video Pak 80. Ideal for small letters, though limited. Very easy to use. Formats as you type. (Cassette version is for use without 80-column unit)

Supplier Impex Designs (UK) Ltd

Address Metre House  
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Middlesex HA5 0TY  
Phone 01-900 0999

Value for money n/a

Reviewed coming soon

### Program VIZAWRITE

Format cartridge or disk

Price £179.95

Summary: Written specifically for the 64 - uses 64's facilities to the full. Easy to use, escape-codes or cartridge. Very good facilities. Has associated spelling checker (Misspell). Formats as you type with 40-column width option.

Supplier VIZA Software

Address 10 Mansfield Row  
Ealing  
London W5 8SE  
Phone 081 913790

Value for money n/a

Reviewed February 1984

### Program WORDPRO 3 PLUS/64

Format disk

Price £92.00

Summary: Been around a long time, rather dated in some respects. Compatible with other CBM versions. Good range of facilities plus an excellent manual. Formats on printing

Supplier Wege Computer Ltd

Address 22a High Street  
Caterham  
Surrey CR3 5EA  
Phone 0883 48238

Value for money 0.4

Reviewed April 1984

### Program QUICK BROWN FOX

Format cartridge or 80 column board with WP included

Price £69.00 (cart)  
£142.00 (80-col)

Summary: A lot of good facilities let down by poor editing method. Does not take advantage of the facilities of the 64. Very good manual. Formats on printing

Supplier SPT Electronics Ltd

Address Tollesbury  
Essex CM9 8SE  
Phone 0623 868484

Value for money 0.5

Reviewed December 1983

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The problem with buying a home computer, as you may already have discovered, is there's often very little software to go with it. Or all that is available is games, games and more games.

There's no such problem, however, with the Commodore 64. It has a more extensive range of serious software than any other home computer.

It also has an unusually large (in fact elephantine) 64K memory, as well as every peripheral you're ever likely to need.

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When all's said and done, however, we do have to admit that in one respect the Commodore 64 isn't up with the competition. It costs around £229, much less than any comparable machine.

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## WORDCRAFT 40

Format cartridge

Price £69.95

**Summary** Long favourite of C64 users, compatible with Pet and Vic variants. Good range of commands that are easy to use. First edition of manual rather poor. Formats as you type.

**Supplier** Audiogena Ltd

Address 34-36 Crews Street  
Reading  
Berks RG1 2EN

Phone 0734 586334

Value for money 0.4

Reviewed January 1984

## SCRIPT 64

Format disk

Price £80.00

**Summary** Screen spelling checker. Uses non-standard method of file storage with manually updated directory. Reasonable facilities. Good selection of print options using a control map. Formats as you type, but option for some formats as you type commands.

**Supplier** Impex Designs (UK) Ltd

Address Metro House  
Second Way  
Wembley  
Middlesex HA9 8TY

Phone 01-900 0559

Value for money 0.5

Reviewed to be reviewed

## WORD WIZARD 64

Format cassette

Price £5.99

**Summary** Very low cost, very basic program (at single-page letters only) - adequate for what it sets out to do. Formats as you type, although tabs etc are formatted on screen as well.

**Supplier** Bubble Bus

Address 87 High Street  
Towcester  
Northants NN9 1RX

Phone 0822 355462

## EASYSRIPT

Format disk

Price £75.00

**Summary** Commodore's own product, written specifically for the 64 (by Precision Software). Good range of facilities. Easy to use and has an excellent manual. Has an associated spelling checker (Easyspell). Formats as you type.

**Supplier** Commodore Business Machines

Address 675 Ajax Avenue  
Slough  
Berkshire SL1 4BG

Phone 0753 74282

Value for money 0.6

Reviewed October 1983

## SIMPLY WRITE

Format cassette or disk

Price £35.75 (cass),  
£46.00 (disk)

**Summary** Written in Basic. Reasonable range of facilities. Good range of printers supported. Current disk version has full error-checking. Reasonable manual. Formats as you type.

**Supplier** Simple Software Ltd

Address 15 Bevelstock Road  
Brighton  
Sussex BN20 0DN

Phone 0273 504526

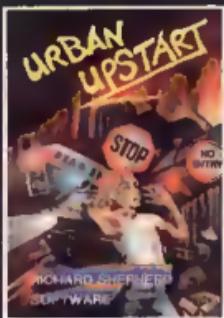
Value for money 0.7

Reviewed November 1983



	SIMPLY WRITE	QUICK BROWNFOX (40 COL)	QUICK BROWNFOX (80 COL)	WORDCRAFT 40	PAPERCLIP	VIAWRITE	SCRIPT 64	WORDPRO 3 PLUS/64	EASYSRIPT	WORDMANAGER (40 COL)	WORDWIZARD (80 COL)	THE WORD	WORDWIZARD 64
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Output formatting	3	4	4	4	4	4	5	4	4	3	3	4	2
Printer support	4	4	4	3	5	3	4	2	3	2	2	5	2
Document size	3	4	4	3	4	5	4	3	4	2	2	4	1
Manual	3	4	4	2	4	3	3	5	5	3	3	5	2
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Error handling	3	4	4	4	5	5	3	3	5	3	3	4	3
Spelling check	0	0	0	0	0	2	4	0	2	0	0	0	0
80-column option	0	0	4	0	0	0	0	0	0	0	4	4	0
Overall facilities	3	4	4	4	5	4	3	4	4	2	2	5	1
<b>TOTAL POINTS</b>	33	37	41	40	49	50	40	30	40	28	32	53	18
<b>Value for money score</b>	0.7	0.5	0.3	0.4	0.5	0.6	0.5	0.4	0.6	1.4	0.2	0.2	3.1

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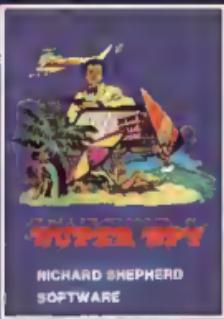
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# MICRODEAL

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James

The 64 ought to be an excellent computer for games - and fortunately some suppliers are indeed taking advantage of that. Others aren't. Here's this month's crop of reviews.

How do we assess games? Basically we play them - which may sound obvious, except that all the reviewers have seen so many games that they can apply a bit of comparative experience to the evaluation.

We rate games out of five for each of four criteria. **Presentation** means how well the thing is packaged and how good it looks on the screen; dull graphics and poor sound get marked down here. **Skill level** refers to how much skill (of whatever kind) is required to play the game - so if pure chance is involved, the game gets a low mark. (But don't dismiss it on that: some 'chance' games are great fun.) **Interest** is an answer to how well the game did at maintaining the reviewer's interest in it. And **Value for Money** is obvious enough: it's our overall conclusion about how it compares with other games and whether we'd buy it ourselves.

### AARACH! CONDOR

Joystick only  
Price £7.95

The scene presented in this graphical game is that of a mountain landscape with a damsel laying helpless, having fallen down the mountainside. A strange vulture-like bird is swooping down to save her and carry her off - the question is can George, the local hero, save her? That of course depends on how good you are at controlling George's actions with the joystick.

To save the damsel, George has to climb the mountain, avoiding arrows shot by the local warriors, and deadly creatures and eggs carefully aimed at him by the vultures. Once at the top of the mountain, George must seize the conveniently placed spear and hunt it accurately at the giant bird - but he may be accurate as there is little time to spare! (spear?)

The main criticism is that only a single scene is provided compared with the many multi-framed graphic adventures now available. Nevertheless, the graphics and sound for this single scene are very good.

PR/WG

Games Machine

Presentation:     
Skill level:     
Interest:     
Value for money:

### BONKA

Joystick only

Price £6.95

This is the first version of Panic for the 64 that I have seen; doubtless others will follow. Our hero has five floors to patrol in his quest of extracting the meannies into the community prepared traps. To start the fun and games the all-important hammer needs to be collected from the top floor with only one meester to avoid that shouldn't prove an unmanageable task. Each time a success is recorded, the meannies return with another added to their

J. MORRISON FOR COMMODORE 64  
**MICROS Bonka**



# SCREEN SCENE

ranks (to a maximum of six). If you bodge up the execution process they naturally leap from the hole fashing with anger.

Large-size graphics and hall of fame are plus features; and if you're interested the screen is pink.

LS

J. Morrison (Micros)

Presentation:     
Skill level:     
Interest:     
Value for money:

### BUMPING BUGGIES

Joystick only

Price £6.99

The player, controlling a red car, is presented with a bird's-eye view of

a race track. The other racers behave like stock cars by attempting to barge you off the course - it's rough on them! You can reciprocate and also boost up your score.

One up your sleeve is the ability to leap into the air to escape danger, but this manoeuvre is only possible at speeds of 100mph plus and approaching the water jumps that course of action is obligatory. There are four seasons to race through, marked by different colours for the course, and a choice of 20 different tracks.

A title-screen theme tune coupled with good sound effects, along with the ability to develop a

main adversary is now composed of rotating segments and the spider becomes a fireball. Missiles and mother ship also demand your attention.

In essence that program is virtually the same as Cosmic Split but with minor graphical variations. Even for a newish machine like the 64 there are an awful lot of concepts in need of extermination.

On the whole, a worthy attempt at diversifying a familiar theme with all the usual problems still facing the player.

LS  
Rabbit

Presentation:     
Skill level:     
Interest:     
Value for money:



### CONFLICT

Joystick or Keyboard

Price £14.75

Many of the comments made about Galaxy Conflict apply equally well to Conflict. Both are board-based strategy games in which you have to manage all the resources associated with making war. But there the similarity ends. Martech has managed to produce two games on the same principle that feel very different.

In Conflict, instead of having your resources automatically increased by the computer each round, you either have to trade

plundered or spent your cash. Across can only be raised if you have the funds. This sounds like a morally healthy idea. If the game takes off it could teach a whole generation in a painless way that war costs too much.

The board is divided into rows and columns (from A to Z and from 1 to 30). More than half of it is sea. The rest is split into two territories. You can either play an endgame where you try to invade the enemy city, or you can opt for more limited warfare and try to occupy the largest amount of territory after an agreed number of moves.

Revenue is raised through share dealing, through forays to capture neutral shipping and through prospecting for oil. The stock market values go up when the shares are bought and down when they are sold. The computer works out the relative changes in value. Oil can be found on a randomly located series of squares in each territory. Ships at sea are blown about according to the weather.

The game has enough variables affecting decision making to keep the most ardent empire-builder scratching his/her head well into the night.

TH

MarTech Games

**MICROS Cybermen**  
Presentation: **\*\*\*\***  
Skill level: **\*\*\*\***  
Interest: **\*\*\*\***  
Value for money: **\*\*\*\***



**CYBERMEN**  
Joystick only  
Price £4.99

Of Borker/Wimok provenance, this one may well make its Yorkshire based supplier some blarney. You do correct the untrapped hero through a maze of voidoids with the screen sliding from one area to the next

twice a game, but it's a bit while you have to play the platinum beta scattered throughout the space station.

Robot guard each room but these can be shot, not so the cleverer who can also pass through walls. The only method of escape here is to go to the next room ie memorising not to trigger in the doorway for fear of electrocution. Again here avoiding bullets it's a big no no to touch the walls. As you progress extra rooms will greet you through every portal. Cybermen also features a Hall of Fame.

New game **LS**

*J. Morrison (Micros)*

**Presentation:** **\*\*\*\***  
**Skill level:** **\*\*\*\***  
**Interest:** **\*\*\*\***  
**Value for money:** **\*\*\*\***

## CYCLONS



**CYCLONS**  
Joystick only  
Price £4.99

The music from Star Wars probably has to be a space battle but it's a contrast with a difference.

Your spiraling green fighter craft needs continuous monitoring to prevent it bouncing aimlessly around the screen, and (if selected from the menu) on to the jagged rocks too. The joystick controls not only direction but also velocity and I found constant adjustments to be necessary. From two to four whirling red aliens will engage you, plus one containing purple saucer, according to difficulty level. Laser bolts may be normal or ricochet so in all there are several options of play. Collisions between enemy ships can be arranged adding cascades of white debris to the screen.

Overall the graphics and sound

effects are adequate for an interesting, enjoyable game, though.

*Rabb*

**Presentation:** **\*\*\*\***  
**Skill level:** **\*\*\*\***  
**Interest:** **\*\*\*\***  
**Value for money:** **\*\*\*\***

## DAMSEL IN DISTRESS

Keyboard only

Price £7.95

This graphical game of skill is set in a medieval surroundings. Weakened by poison, your knight must leap up and down various levels of the castle to rescue the princess who conveniently holds the antidote.

On the way he'll have to jump over ghosts and menacing spiders, and he must collect amulets which are used to build a bridge across to the princess.

There are many versions of these graphical games on the market now, but this is not one of the best. Colours and sound are good but movement is slow and jerky. Allegate also appears to have an aversion to joysticks despite their suitability for this style of game, thus one only works via the keyboard.

*PR WG*

*Allegate Software*

**Presentation:** **\*\*\***  
**Skill level:** **\*\*\***  
**Interest:** **\*\*\***  
**Value for money:** **\*\*\***

*PR WG*

## 3D TANK

Joystick or keyboard

Price £39.99

The presentation is poor and the graphics are not very good. The sound is reasonable but the game is not very challenging.

Dicky (the owl) has had his board of diamonds stolen by Stephen (the spider) who guards one of them at the centre of his web. To recover it you manoeuvre Dicky over the web strands (win turns black) until all the strands have been weakened and the web explodes. To make life much more difficult the last strand to be weakened must be the central one.

Otherwise you lose a life. Throughout the game Stephen chases Dicky and also attempts to re-

## SCREEN SCENE

and the screen you lose a life. It's a bit of a bug but it's a bug that's quite persistent. That is, if you get to the web and it's destroyed and the web is destroyed before you can get to it.

Name as a friend is provided when you log on. Each time a player has covered the most levels, it's more difficult and both of play and start playing on a single table. It's a bit like Stephen's friend. One game point is added to each. However, if you win, you get two points and if you lose, you get one point.

Highly recommended, excellent value for money.

*Romantic Software*

**Presentation:** **\*\*\*\***  
**Skill level:** **\*\*\*\***  
**Interest:** **\*\*\*\***  
**Value for money:** **\*\*\*\***

**Presentation:** **\*\*\***  
**Skill level:** **\*\*\***  
**Interest:** **\*\*\***  
**Value for money:** **\*\*\***

*PR WG*

## DICK'S DIAMONDS

Joystick or keyboard

Price £9.99

This game is highly original and totally addictive example. I arcade action at its best, making good use of the colour and graphics capability of the 64.

Dicky (the owl) has had his board of diamonds stolen by Stephen (the spider) who guards one of them at the centre of his web. To recover it you manoeuvre Dicky over the web strands (win turns black) until all the strands have been weakened and the web explodes. To make life much more difficult the last strand to be weakened must be the central one.

Otherwise you lose a life. Throughout the game Stephen chases Dicky and also attempts to re-

**Presentation:** **\*\*\***  
**Skill level:** **\*\*\***  
**Interest:** **\*\*\*\***  
**Value for money:** **\*\*\*\***

# Fly the world's deadliest mission!

## BLACK HAWK

Black Hawk is the world's deadliest aircraft, but this is the world's deadliest mission... A formidable and formidable group of islands are under siege.

Your target is the enemy's main airfield, heavily defended by missiles, gunships and anti-aircraft guns.

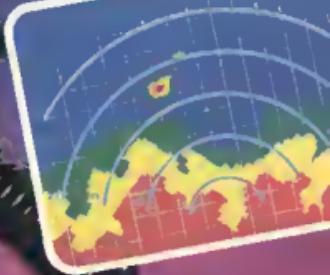
Although the speed and firepower of Black Hawk are unmatched, they alone cannot help you win through. On such a mission, strategic skill is the ultimate weapon.

Your on-board computer, with its dual attack and defence screens, will assist you in increasing your strategic loss factor (SLF) and achieving the mission objective. You also have an 8 page scenario to guide you through more than 30 missions.

Black Hawk is one of the most advanced games of action and width for the Commodore 64. You will find it in all major software retailers.

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**CREATIVE SPARKS**



FOR COMMODORE 64



# SCREEN

## INDIANS ABSURDLY

Attack

Your mission is to watch the American Embassy and if a terrorist passes the window you shoot at him. Kill enough and you get promoted: to shoot a hostage, and demolition intermediate.

This is a simple reaction game where you move a cross-hair sight over windows and shoot. Terrorists appear in shirts of one certain colour - so don't shoot any other colour! But what makes life harder is that they change colour now and again and your best target suddenly becomes a hostage.

Every six shots you must move your gun sight to the armoury and fire at it to reload. This is usually when all the best targets appear (it's as logical to shoot an armoury I suppose as it is to bomb hell dumps in Scramble...).

As a subject for a game the morality is a little shaky but leaving that aside, I also found it becoming tedious after a while. The only variety is in the shirt colour changing and the overall speeding up as you get more points.

DB

## Utronics

Presentation: **\*\*\*\***  
Skill level: **\*\*\***  
Interest: **\*\***  
Value for money: **\*\*\***

  
Bubble Bus features communitasness music in this game and I would suggest that the graphics are noteworthy too, but the action I found less interesting.

A gamekeeper, armed with a shotgun, is protecting his henstocks from hovering eagles in a setting akin to a landscape painting. It's a matter of downing the birds before or after they steal the fowls, there's a choice of two methods of shooting, according to difficulty level. Once free of your charges have been lost, the game is over - although bonus stocks are awarded every 5,000 points, assisted by a flood of ducks.

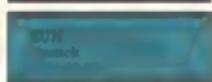
Eight levels of skill, a high-score table and competent sound effects - not enough variation of play, how-

ever. That all makes this a game directed at the juniors.

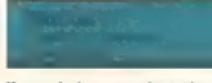
LS

## Bubble Bus

Presentation: **\*\*\*\*\***  
Skill level: **\*\*\***  
Interest: **\*\***  
Value for money: **\*\*\***

  
Another example of a well-known pub arcade game being adapted for the C64. In this case the capabilities of the machine have been used to maximum effect, resulting in an excellent game.

You control Quasimodo (the hunchback) who has to leap along the castle ramparts to rescue Esmeralda, imprisoned in the castle stronghold. To reach the princess Quasimodo must negotiate 18 screens of fun and excitement.

  
You control Quasimodo (the hunchback) who has to leap along the castle ramparts to rescue Esmeralda, imprisoned in the castle stronghold. To reach the princess Quasimodo must negotiate 18 screens of fun and excitement.

Here we look at two packages that approach the problem of putting the social climbers game on the screen in two very different ways. Hendic's package allows considerable scope, and Bridgemaster seems to teach the game as well as provide hands against which you can practice.

To start with we're not convinced that the Bridgemaster approach is the best way to learn the game. Bridgemaster is certainly a good stab at trying, however the introductory book (included with the two commentary tapes) is well laid out and the tapes are excellent.

Presentation on screen takes the form of so many written interpretations, hands are numbered North, West, East and South, beginning with 'hands' and no bidding sequence.

The program takes you through the essentials of bidding, to the complex routines of conventional bidding.

We certainly found it all well-presented and informative, but one small gripe was that the only correct card (or bid) could be played - all other entries were invalid. This actually omits the possibility of learning by one's mistakes, and warning all the time can get boring.

Hendic's cardigan, on the other hand, allows you to play any card you wish and therefore provides a computer opponent rather than a learning package. The presentation of Hendic's seems basic, though, and there's no grading from easy to difficult hands. One large criticism is the lack of any bidding sequences - the bid is merely called and no reply given. This tends to degenerate the game to a form of waltz with a bridge format.

If you're a beginner, the Bridgemaster package certainly comes up trumps (sic) because of the unrelenting hands to play. Hendic's is one for the more experienced. Having said that we still learnt a lot from Bridgemaster and overall we preferred that package.

RR

## Hendic

Presentation: **\*\*\***  
Skill level: **\*\*\*\***  
Interest: **\*\*\*\***  
Value for money: **\*\*\***

  
Bridgemaster

Presentation: **\*\*\*\*\***  
Skill level: **\*\*\*\***  
Interest: **\*\*\*\***  
Value for money: **\*\*\*\*\***

each one more difficult than the last. These include swinging on a rope over a fiery pit, dodging arrows and fireballs whilst leaping over trenches containing knights with sharp pronged pikes (oooh! that smarts!) and finally, don't forget THE BELLS!

Animation and graphics are superb, all the family will thoroughly enjoy Hunchback PR/WG Ocean Software

Presentation: **\*\*\*\*\***  
Skill level: **\*\*\***  
Interest: **\*\*\*\***  
Value for money: **\*\*\*\*\***

  
A lengthy load time is repaid by a superb example of the City Defence genre. As soon as you're

  
A lengthy load time is repaid by a superb example of the City Defence genre. As soon as you're

ready to go, take a last look at the pretentious, multi-hued space city you're about to defend. Unmissable different saucers and UFOs (I lost count!) will make kamikaze runs at the metropolis in your charge. Each variety employs different tactics, and they may well try to ram you. There are 24 waves in total and only megaplayers will see them all - unless you cheat and preselect them. Your craft, once moved, is continuously in motion vertically or horizontally and it's quite an art to make an interception while avoiding collision with the aliens - not to mention the screen boundaries. Fortunately your laser is of the rapid fire variety you certainly need it! Success generates glorious explosions to the accompaniment of it's-all-happening sounds. Some of the variants will skip past your defensive efforts and smash chunks from your real estate; the game finishes, of course, when the city is no more or your fuel succumbs.

Really good graphics, superb animation - sprites coming into their own, and all very colourful. The action is utterly continuous, indeed the only respite is between attack waves, with a fair degree of skill needed.

Could that program be the reason you bought your 64? Certainly one of the best space games I've seen.

PS

Presentation: **\*\*\*\*\***  
Skill level: **\*\*\*\***  
Interest: **\*\*\*\*\***  
Value for money: **\*\*\*\*\***

  
Nightmare Park presents the player with a rudimentary maze and the object is to emerge from the exit (something like Hampton Court). At frequent intervals during negotiations of the maze the computer presents you with problems which must be overcome for you to survive. Some of these involve brain power, such as mental arithmetic questions, others require manual dexterity such as manoeuvring your character around a herd of stampeding unicorns. Finally, some of the problems involve pure chance, such as guessing which of three doors does not conceal a hungry blob!

The skill level is selectable and there are a wide variety of problems to solve. But graphics, animation and sound are not very impressive.

www, and the game is only likely to appeal to the younger punter who is usually less daunted by this more elementary form of games programming.

WG/P

ARI Software

Presentation:	★★★★
Skill level:	★★★★
Interest:	★★★★
Value for money:	★★★★

### NEPTUNE'S DAUGHTERS

Joystick

Price £7.95

Something novel for deep-sea divers. The graphics are superb. You control a diver armed with what looks like an underwater laser. The aim of the game is to swim your man through various grotesque, avoiding the very determined octopus that swims after you through screen after screen, until you come, eventually, to the sea serpent's lair.

The concept has a lot in common with the classic 'copes' arcade games where you try to fly through caves while avoiding the mussels. But the graphics and the obstacles are new enough to make this game an original.

The route through the underwater caverns is blocked in the early stages by sucker-like weeds. Repeated firing shreds them and clears the way, but never forget the octopus. It returns again and again.

I never got to see even one of Neptune's daughters. My man kept getting caught in a no-exit cavern swarming with amoeba. These come at you from all sides and for those with normal reflexes, that's as far as you get.

Beyond this lie the moulting crabs which you need to feed to the sea serpent until it falls asleep and lets you free the maiden. Sounds like a fairy tale to me. TH

English Software Company

Presentation:	★★★★
Skill level:	★★★★
Interest:	★★★★
Value for money:	★★★★

### PARATROOPERS

Joystick or keyboard

Price £5.95

With so much action that you may mistake it for a Lebanese ceasefire, this offering also has its graphical attractions - definitely



made in Splashtana, its appeal is directed fairly and squarely at quick-shot fiends.

After selecting the offensive/defensive option from the menu, the player finds an ack-ack gun warding off a massive armada of helicopters (with appropriate sonics) that are dropping paratroopers, complete with billowing parachutes, towards your bunker. Various bombing runs to add to the jollity. The whole scene is quite realistically depicted. The multitude of explosions enhance an already colourful scene.

Ack-ack shells can be sprayed around to set up a defensive umbrella. But inevitably some commandos get through signalling a tank to enter and blast away your gun. And I found the whole animation most pleasing. LS

Rabbit Software

Presentation:	★★★★
Skill level:	★★★★
Interest:	★★★★
Value for money:	★★★★

### TROOPATRUCK

Joystick or keyboard

Price £5.95



TROOPA TRUCK

Joystick or keyboard

Price £5.95

An infuriating dollop of fun which all my family enjoyed. Four sepa-

rate coloured tiers of scenery scroll at different rates to provide an illusion of moving in an arid, spacious environment; a fitting tune (turned off by F1 if you must) accompanies your boggy on its perilous journey.

It's not unlike Skramble on terra firma... except that the terra is not too firm. Craters the damps (as in Skramble there seems no logic in this).

The usual format does present some orientation problems at first but this is soon overcome. After a given duration on this track you are switched to a dogfight screen, then back to the course again. After several such encounters, with different aliens each time, you get to meet the final obstacles.

Five skill levels and a demo mode (great for reviewers) are provided. It is certainly different and features unusual graphics. But to my mind the play is too disjointed; on the other hand, my youngster loved it. LS

Big G

Presentation:	★★★★
Skill level:	★★★★
Interest:	★★★★
Value for money:	★★★★



### THE QUEST OF MERRAVID

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Keyboard only

Price £7.95

No prizes for guessing from the title that this is an adventure game. A novel feature though is that the single cassette has a version for the CBM 64 on one side and the Vic (+16K) on the other. If this feature were more generally adopted it would make eventual upgrading of

the Vic-20 to a CBM 64 more attractive.

This is a classic text-only adventure game in which instructions are provided in lower-case letters, with some use of colour. You are attempting to retrieve the magical firestone which was guarded by an evil dragon. Before you can engage the dragon in battle you must collect a complete set of armor, the various pieces being scattered throughout the land - and hence the adventure starts.

All the ingredients of the enjoyable adventure appear to be present. One criticism, however, is that there's no save-to-tape option so you must start afresh each time you come back to it. WG/P

Marches Games

Presentation:	★★★★
Skill level:	★★★★
Interest:	★★★★
Value for money:	★★★★

### ZAPPY ZOOKS

Joystick only

Price £5.95

Yet another dot-gobbling game with very little attempt to hide its Pacman origins. The joystick is used to guide Whirly along the space corridors collecting 'alpha particles' and avoiding the Zooks. If Whirly collects a power drain plug, the Zooks are temporarily drained of energy and in this state Whirly can catch them.

The graphics are good but not outstanding, and the movement through the maze is a little awkward. Two movement options - continuous or touch mode - are however provided, so that when you release the joystick Whirly continues in the direction you last commanded (continuous) or he stops moving (touch). Also selectable is the number of Zooks (from one to six).

The action starts off slowly but speeds up as you clear frames and move up a level - 14 different levels are provided. A final feature is a practical mode in which you can pre-select the higher levels to practice at the faster speeds.

In conclusion - so marks for originality but not a bad version of an arcade classic. WG/P

Romnik Software

Presentation:	★★★★
Skill level:	★★★★
Interest:	★★★★
Value for money:	★★★★



# A Real-Time clock for the 64

by David Bolton

It's a little known fact that the 64 contains not just one but two real-time clocks - in addition to the 'software' clock using TI and TIS. The information about the clocks is in the Programmer's Reference Guide; but unless you are into reading technical appendices you wouldn't find that out. David Bolton reveals all ...

The 64 has two I/O chips known as 6526. These are manufactured by MOS Technology, a company that is owned by Commodore, and they are upgrades for the well-known 6522 (the so-called 'Versatile Interface Adapter', or VIA for short). The 6526 is known as a Complex Interface Adapter (or CIA), but I think it's called a CIA because it's a chip with intelligence. (Omphap - Ed.)

Four registers in each chip control the clock times. These are registers 8, 9, 10 and 11, and they live at the addresses shown in the table.

(The program given later takes care of all this.)

The second problem arises because MOS Technology made the real-time clock easier to use from machine code. The clock employs a system called Binary Coded Decimal (BCD) instead of binary. Instead of storing the time as an absolute time, say, 47 seconds, they value is stored as two decimal digits - 74 and 7. The true value is obtained by multiplying the hundreds digit by 16 and adding the right.

So 47 seconds is represented as  $4 \times 16 + 7$  which is 71. This may seem an odd way to do things, but it's because the processor would have to divide by 10 to get the left-hand digit back (when displaying 0). If it were actually stored as 47, the 6526 would only have to divide by 16, which is done by a mere four subtractions: division by 16 is very straightforward and takes much longer.

The last thing to note is that the top bit in register 11 says whether the time is AM (the bit is cleared) or PM (it is set).

## The listing



(The program given later takes care of all this.)

The last two columns need some explaining. Because the clock is driven by hardware it functions independently of the 6502 processor. This means that it can change while being read or set. Even though the processor can do about 30,000 instructions in a tenth of a second, Murphy's Law would still probably cause the clock to be changing just as it was being read or set.

To show this, consider the time as being 9:59:59.9 when the clock is read. There are four registers which must be read separately. If the hours element was read first, the seconds and minutes might change and so the time would be 9:00:00.0. If seconds were read first, it might be read as 10:59:59.9

The program here sets up a machine-code routine that will read the time into the screen at all times - unless you use the cassette tapes - in which case the screen goes

(blank anyhow) or you press **RUN/STOP** and **RESTORE**. Check the lines of **DATA** carefully and **SAVE** it before you run it. If you get it wrong when keying in, though, the program will stop and tell you.

When you first run the program, it will ask you to enter the time in the

When you enter the time, make it a few seconds in advance and before you return about half a second after the time. Within a second the correct time will be displayed in the top right of the screen, and it will be read out once more, and read again if necessary.

### Other hassles

There are two other problems to be dealt with before we can get our clock right. The first arises because of the difference in trains in the USA. In America, the trains run at 60 mph and in the UK at 50 mph. All 60 mph scaled cover have set out for

For the technically minded, the machine code uses the IRQ interrupt routine and re-displays the time once every second. It always displays the current printing colour (obtained from the current foreground colour).

The people there thought of this and set a bit aside in register 14 of each chip to say whether the main frequency is 60 or 60Hz. So before the clock is used you must

POKE 56334, PEEK(55334) OR 128

screen or sound music [L] gave a program for the later days."

Registers	Chip 1	Chip 2	Registers	Reading	Writing
8	54528	54584	0	0.1 seconds	Unlatch
9	54529	54585		—	—
10	64530	54586		seconds	—
11	54531	54587		minutes	—
				AM/PM	Latch
				8. Hours	—

L10 T. M. FOR P. 149152 TO 472082 READ AIT = T + AIT ONE, 1,41 NEXT  
 L15 T. LIBROS THEN PRINT DATA, WRONG 1END  
 20 PRINT TCOL20 CENTER TIME (A/P, MIN, SS), 1  
 30 PRINT AIT, AIT/LEN(AIT) 10 THEN 20  
 40 H=INT(AIT/LEN(AIT)) 10-P THEN H=M-P  
 50 H=M-HALF(MD4(.5,.5,.2))  
 60 IF H=0 AND H=.5 THEN H=.5  
 70 IF H=.5 AND H=.1 THEN H=.1  
 80 IF H=.1 AND H=.05 THEN H=.05  
 90 ST=INT(.5\*H) AND H=M-P  
 100 PRINT ST, H, M-P  
 110 GOTO 20

240	EW16120, 169, 21, 141, 20, 169, 192, 141, 21
500	EW16120, 169, 21, 141, 20, 169, 192, 141, 21
510	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
520	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
530	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
540	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
550	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
560	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
570	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
580	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
590	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
600	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
610	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
620	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
630	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21
640	EW16120, 173, 14, 20, 169, 192, 141, 20, 169, 192, 141, 21

Register	Chip 1	Chip 2	Function	Resetting	Writting
8	54.32.0	56.55.4	0.1 seconds	Unclock	Start
9	54.32.0	56.55.5	seconds	—	—
10	56.55.0	56.55.6	minutes	—	—
11	56.55.1	56.55.7	AM/PM	Latch	Stop
			& hours		

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# Hi-res Pictures – using your joystick

By Albert van Aardt

Here is a little program that will allow you to draw pictures on the 64's screen in high resolution. You cannot print it (hopefully somebody out there will decide to write a hi-res print utility); but you can generate quite nifty pictures.

Lines 200 to 299 of the program provide the menu. Obviously you can change them, but watch out for line 285! You need that to set up the addresses for the hi-res screen.

Lines 230 to 250 ask for the X and Y co-ordinates to be used in starting the program. As the Commodore 64 has a resolution of 320 by 200 pixels, this is checked. Note that these co-ordinates will only be used for the first time thereafter the plotting will start at the point where you stopped.

Lines 300 to 330 set the 64 in hi-res mode. Lines 400 to 430 clear the hi-res mode, because it will still be full of garbage from power-up (or it will contain whatever you've last put there – maybe some of Klingons or something).

Line 30 then reads address 56320 – that is the place where joystick 1 puts its information. Line 30 checks to see if the FIRE button has been pressed, and clears the screen if so.

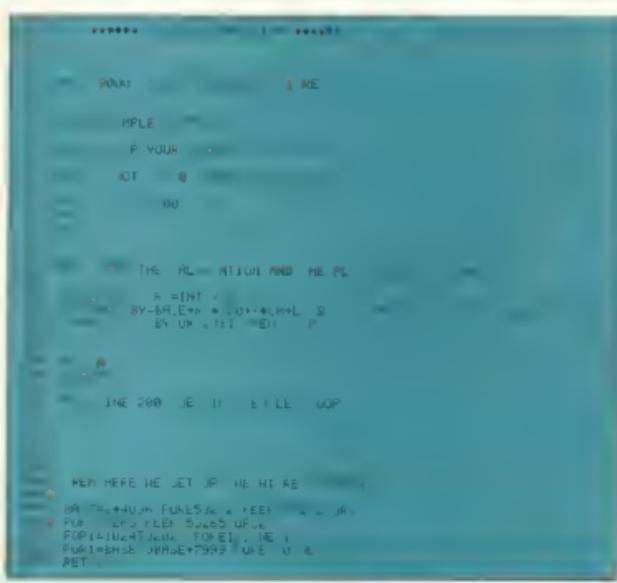
Lines 50 to 130 figure out in which direction you've pushed the joystick, and line 140 calculates the point to be plotted. The actual plotting is done in line 150.

And that's it! The heart of the program is in 130 to 150, and the same coding can be used for any hi-res plotting program. By varying the value of X and Y, you can draw straight lines, curves, circles and the rest.

Type in the program as it is, and save it. Then NEW and re-enter 130 to 150, 300 to 420, and SAVE that. This is now a hi-res subroutine, and you can use it anytime you need hi-res plotting. Remember that subroutines 300-330 and 400-430 need to be run before you can use the plotting ones.

Program 2 is an example hi-res program, using the lines mentioned above. You should be able to figure out what it does, it's really very simple.

```
100 JS=PEEK(56320):F=J2&H2&I2:J2=15-(J2&H2&I2)
110 REM GET DIRECTION
120 J2=PEEK(56320):F=J2&H2&I2:J2=15-(J2&H2&I2)
130 IF F<0 THEN 100:SUB 400:W=120
140 IF J2>500:J2=500:K2=140:THEL=W-1:GOTO 160
150 IF J2>800:J2=800:K2=140:THEL=W-1:GOTO 160
160 IF J2>1000:J2=1000:K2=140:THEL=W-1:GOTO 160
170 IF J2>200:J2=200:K2=140:THEL=W-1:GOTO 160
180 IF X>255 THEN X=0
190 IF Y>199 THEN Y=0
200 IF X<0 THEN X=319
210 IF Y<0 THEN Y=199
220 CH=INT(X/8):RU=INT(Y/8)
230 LH=CHR(64+BASE+RU*2+J2+K2+LN):SI=7---:PAINT: REM TO CHROUT:
240 POKE 80,FEEN:BY=BY+2:W=1:REM TO PLU!
250 GOTO 180
260 REM INSTRUCTIONS
270 PRINT "JOYSTICK D-PAD"
280 PRINT "STRT CO-ORDINATES: 00<319 00<199"
290 PRINT "ADJ JOYSTICK IN FURT 2"
300 INPUT "X= ",X
310 INPUT "Y= ",Y
320 IF X>319 THEN 1000
330 IF Y>199 THEN 1000
340 CH=INT(X/8):RU=INT(Y/8)
350 PRIM: REM PRESS FIRE TO CLR SCRN
360 FOR I=1TO900 NEXT I
370 PRINT "ADJ COORD LUCK"
380 FOR I=1TO900 NEXT I
390 BASE2=#4079:POKE 153272,PEEK(153272)OR8
400 RETURN
410 REM SET TO HI-RES
420 POKE 5225,PEEK(5225)OR32
430 FOR I=1024TO2048:POKE I,3:NEAT
440 RETURN
450 REM CLEAR HI RES SCRN
460 FOR I=BASE2TOBASE2+7999:POKE I,0:NEAT
470 RETURN
```









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the address of the routine names  
1 - (we'll see why we have to take 1 off the address a little later) The end of the table is  
marked by a byte containing zero. The section of DECODE  
which checks the command  
name starts at DECODE7

Rather than use the CMP  
instruction to compare the  
character from the command  
table with the one from the Basic  
program, I use EOR. This will  
set the processor-zero flag if the  
two bytes are identical, but if the  
only difference is the top bit, it  
additionally leaves \$00 in the  
accumulator.

As the last character in the  
command has \$00 added to it,  
this allows you to get a match  
between "c" and "C" in this case  
it also allows you to use the  
Commodore form for  
abbreviated commands; so HE,  
HL, and HEI will all work as  
well.

If the two characters do not match  
(DECODE7), the program calls  
FENDCM, this finds the end of a  
command in COMTAB by  
searching for a shaded character.  
We then skip over the jump  
address and test for the end of the  
table by testing for the next  
byte being a zero. If it is, then  
we have not found one of the  
extra commands, and the  
program restores all the 6502  
registers and lets Basic get on  
with its job.

If the two characters are the  
same, the program jumps to  
DECODE1. This just increments  
the pointers (so that we can look  
at the next pair of characters)  
and then jumps back to DECODE12.  
If the two characters differ only  
in the top bit, bit 7, the program  
goes to DECODE12 which checks if  
we have reached the end of the  
command in COMTAB. If not,  
then we have found an  
abbreviated command, and the  
program has to move the pointer  
TMPO to point to the end of the  
command.

In either case, when the  
program reaches DECODE13 we  
have found one of the extra  
commands, and the TMPO points  
to the end of the command entry  
in COMTAB.

Up till now we have not altered  
TXXTPTR - which is obviously  
important because we would  
want to jump back to the  
interpreter with TXXTPTR intact if  
we could not find one of our  
commands in the Basic text. Now  
that we have identified a  
command, TXXTPTR has to be  
moved to point to the end of the  
command so that later routines  
can use it.

All we have to do now is get  
the jump address from COMTAB  
and jump to the routine. TMPO  
points to the last character in the  
command name, so we need to  
set the Y register to 1 to read the  
first byte of the address using the  
indirect indexed addressing  
mode.

As the 6502 does not have an  
indexed swap instruction, we  
have to do a little fiddle. What  
we do is to push the address on  
to the stack and then do a RTS.  
The processor pulls the address  
off the stack just as though it had  
been put there by a JSR  
instruction and jumps to the  
routine. Remember that we  
stored the address-1 in  
COMTAB? This is because the  
RTS instruction adds 1 to the  
value it pulls off the stack before  
jumping to it.

## The new command

And so we come to the last  
section, a sample extra  
command, executed by the  
routine HELLO. This simply  
prints a silly message on the  
screen and then runs into a  
section called END.COM.

As its name suggests, this  
routine is where the program  
goes at the end of a command.  
All the routines to handle extra  
commands should jump here at  
the end. It restores the 6502  
registers, then tests whether the  
interpreter is executing a  
program statement (in which  
case END.COM1 jumps to CHGIO  
to continue execution) or a  
direct statement (whereupon the  
program returns to Basic at  
command level).

And that is it! All you have  
to do now is dream up your  
own commands. The command  
names are put in COMTAB,  
with the last character shaded  
(which adds \$00 to the value),  
followed by the address of the  
routine minus 1. Don't forget to  
put a zero byte at the end.

If you do design any useful  
commands, why not drop us a  
line that tells us about it? We'll  
print anything that looks  
good ...

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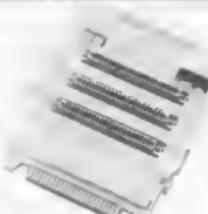
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# Seal of Approval

## What's the Commodore Approved Products Scheme?

by Bohdan Buciak

There's something about a seal of approval that inspires enthusiasm and attracts confidence: like the muesli bar 'approved' by Olympic runners or the Royal coat of arms on your favourite marmalade. If you've got a keen eye for such insignia, you'll have noticed that Commodore has its own stamp of approval which it emblazons benignly on specially selected products from independent suppliers.

But there's more to Commodore's Approved Products Scheme than merely being allowed to display the 'approved' logo. Commodore doesn't (and can't be expected to) give something for nothing. So it charges a royalty to companies taking part, and gives a degree of promotional and marketing support in return: in some cases, it will actually take on a product under the Commodore banner.

That sounds reasonable, but how does the scheme work out in practice? What does it do for the manufacturer or software house - or for you, the customer?

Commodore introduced the Approved Products Scheme five years ago when the Pet, originally intended for the home computing hobby, surprisingly carved a sizeable niche for itself as a business machine. Faced with the problem of providing lead-and-go business software, Commodore began commissioning software houses to produce the goods.

Why didn't Commodore itself take the plunge into software? Simply because it saw itself as a shifter of hardware - no fuss, no extra development, more profit. Commodore big-wigs only recently adapted their corporate strategy to include software and peripheral production (mainly for the Vic and Commodore 64) realising, rather tardily, that a Commodore-size pile of money can be made from this tributary of the market.

### Ancient history

From the beginning, the scheme involved software houses paying Commodore a royalty of five per cent on net sales for the privilege of being included in Commodore's software catalogue.

The first catalogue appeared in the Autumn of 1979 and it supposedly helped Pet buyers choose appropriate software for their machines, reassured that had Commodore's backing.

For its five per cent Commodore undertook to advise on product development and marketing. In theory it assessed product suitability etc. And of course, the availability of the Approved Products Catalogue meant some promotion for suppliers with limited PR budgets.

Inevitably, the scheme grew in a haphazard way (Commodore itself grew in a haphazard way). Not all Pet-oriented products were included for a start. Not all suppliers were convinced of the Catalogue's value. And customers began to doubt (justifiably so, as turned out) that all the products really had been assessed.

### Fresh impetus

Apparently that's all changed now. Enter Ian Slater - carrying a stack of 'Fresh Impetus' - when he became Commodore's Applications Marketing Manager about two years ago. (As it happens, he's sub-

sequently moved on. But the expansion of the Scheme during 1983 - and 1984 was largely his work.)

"If we were taking five per cent in royalties from these people, we ought to give them more support and back-up in other areas", he declared.

Slater's approach was to revamp the scheme by identifying areas in which Commodore's rich harvest of royalties could be most beneficially spent - for both parties.

The major one was joint promotion, in which Commodore works out a joint marketing strategy with the company selling the product - the company submits a plan linked to expected sales and a figure for expenditure is then thrashed out.

That sounds reasonably straightforward but it usually isn't - both parties invariably try to get the best deal for themselves. And since Commodore's putting up the money, guess who wins ...

Ian Slater didn't feel Commodore's stance is dictatorial. "Certainly we have a controlling influence, but it is limited. We don't interfere in a company's marketing method or advertising style. But we do restrict them mentioning other hardware their products are compatible with; the product must be shown on a Commodore machine."

Probably that's not too bitter a pill to swallow when Slater was dangling that great Commodore Seal in front of your nose. But there's a bigger and juicier carrot too.

### Money up front

Three months from the date of signing on to the Scheme, we send a form to the company concerned to find out the volume of the product sold. We then issue a ninety-day invoice. That means that they've got six months to pay the royalty, having already received a sum up front from Commodore for joint marketing schemes."

Of course, that benefitted Slater too; having seen the three-month figure, he was guaranteed a specific sum in royalties which would then be budgeted.

The amount spent on such marketing ventures can range from as little as £1,000 to £250,000 depending on the royalties paid (the latter is the sum recently forked out with Pegasus Software for its suite of accounting packages).

How that's spent is equally flexible and depends mainly on the size and amount of market penetration the company has already achieved. Generally, tactics include stalwarts like direct-mail, advertising, participation in Commodore shows, dealer support and even seminars and training courses.

And then there's the Approved Products Catalogue itself, the 'Bible' for all things Commodore - and it really is all things. One glance through its pages reveals a diversity of product from a computer desk to a software package for administering the Public Utilities Street Works Act (1960).

"At present, the catalogue contains about 75 different companies - 50 when I took over," said Slater. "We don't expect it to grow any more. In fact, it'll probably go down to 70 and the number of different products listed will stay at around 250."

Keeping such a large amount of entries up to date inevitably involves problems, especially if the catalogue is published only twice each year. That means a new product may not appear for some considerable time after it's received approval - a factor that will dampen enthusiasm for the scheme? "Keeping up to date is a problem. But we try to overcome that by sending a list of new products out with our monthly dealer newsletters."

### Business as usual!

Despite the number and range of approved products, there is nothing in the catalogue for the Vic 20 and only a small amount (right at the back) for the 64, all business stuff.

So the dramatic advent of the Vic and 64 hasn't changed the nature of the Scheme; it is still mainly business orientated. Of course, Vic and 64 enthusiasts do have the two VicSoft catalogues, produced four times each year, but that's a mail-order scheme, not an approved products list.

The Vic and 64 have affected the scheme indirectly, though. "The Vic and 64 brought Commodore more downmarket, which meant that we had to pull down the price of business systems. So now we're looking for more mass-market business packages to add to the scheme; Micro-Simplex for example, an accounting system for small retailers." At a mere £150, it's far cheaper than true 'business' packages. There's a great deal of software in the Catalogue that is far

cheaper than mainstream products running on vastly more expensive machines.

### Getting approval

So how does a company get its product into the Approved Product Scheme? The answer's simple - with difficulty.

Slater didn't see the scheme expanding in size despite the fact that he received about 70 new products each week for assessment. Out of that lot, only one is likely to get through.

"First of all, our technical people have to see that the product really works. The supplier has then got to prove that it is selling and that it has an established dealer distribution network, its size will obviously depend on the nature of the product."

"Lastly, the company's got to be prepared to pay the five per cent royalty on turnover - that's on the dealer price, not what the end-user pays."

Those restrictions mean that the catalogue isn't saturated with too many similar products. As Ian Slater points out, "there's room for about five different accounting packages, for none of them are identical - but not for 15."

There's another side to the scheme, apart from getting approval: a product may be taken on by Commodore itself. But this happens very rarely - "we say no to 99 per cent of people who ask us to take on products". That's probably because Commodore itself usually takes the initiative. "If we decide that we need a specific software package for Commodore, we'll go out and get it."

One such product was Easy Script, a word processing package for the 64 developed by Precision Software. The strategy here is the

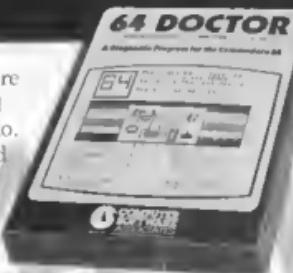
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...re virtually buys the product, undertakes its own packaging and advertising, but pays an agreed royalty on sales to company which developed it

### Approval from the Approved?

In face of it, the Scheme appears beneficial both for Commodore (which acquires a ready-made software and peripherals base), or the supplier (which gets Commodore's market muscle and scope for its product). Does that theory work out in practice? Nigel Lovett Turner, director of Precision Software has no doubts. "It's a bloody good Scheme in principle, there's nothing to compare in America". On the other hand he now regrets having sold his company to Commodore under the scheme: "at the time we were an embryo company. So it was the right decision. Now we're an established software house, we reckon we have made a better job of marketing, but we didn't have the market muscle then".

The main advantage is that we sell in large volumes but we lose no Commodore gives us a small royalty, we see it as a must, use it as reasonable." Being control meant not only accepting what looked to Precision as an unsatisfactory deal, but also having to accept Commodore's decision to give Easy Script away as a freebie with its 1841 disk. "I view the free offer with trepidation. It devalues the product given away per se of no value

words, but he does accept that larger volumes entail larger costs. And there's an incentive for Easy Script owners to buy Precision's own database package, Superbase 54.

Superbase 54 is merely an Approved Product. "It's a first class product which we want under our control now that we've grown and the penalty is we won't sell large volumes so quickly, it will be the thousands, rather than hundreds of thousands."

On merely pays Commodore the 5 per cent royalty and "hard" for a good marketing deal. "People getting involved with Commodore must make sure they're getting a good deal. That's like a warning

### One man band

Software may no longer need Commodore's marketing. But Nigel Lovett Turner points out that the Scheme could be to a one-man-band operation. Software's boss, Michael Hopps, is a teacher who runs the program from home. He developed Designer, a screen character program for his own use in schools. "Being designed for the low resolution so I couldn't get a publisher interested".

That Commodore took it on board as an Approved Product, perhaps because it offered a unique facility, which is obviously the things Ian Slater looks for. Designer has now sold more 100 copies and Hopps has nothing but praise for Commodore. "Talk to me like a friend. They gave me access to technical and lent me disk drives and other peripherals. Being in the Scheme means that the product got much greater publicity, especially in schools, colleges and government departments."

Business back up and general confidence from Commodore has enabled Michael Hopps to adapt Designer for the Commodore machine's hardware capability has opened up the computer design field for him.

He has still greater ambitions for Designer 64 - he wants Commodore to take on the product. "It would be easier for me if Commodore took on tasks like marketing, artwork and disk copying." He sighs, though, that while the product is technically sound, it's not market enough for Commodore's liking.

# COMMODORE APPLICATIONS CATALOGUE



If the Approved Product Scheme gives the impression of helping both Commodore and its independent suppliers, it's probably doing its job. But there must also be something in it for the customer. The Scheme gets the assurance that Commodore has a well-established product, and that the product has established itself firmly in the market. Ian Slater But he quickly added, "There's no guarantee if the product doesn't work".

Should we approve it? ■

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# Commodore User Groups around the world

## Part One – everywhere but the States

### Our annual survey

We've been collecting and updating our information on users' clubs and groups that Victims, 64 enthusiasts and vicariously interested parties might want to join. Here's the list so far – and clubs not listed are invited to contact us with information.

Next month – clubs in the USA.

#### BRITAIN

##### Notional

**ICPUG**  
(Independent Commodore Products User Group)  
Membership Secretary  
11 Lancaster Road  
Newbury Park  
Herts  
Encl IGS TEP

Established and active, with good bi-monthly newsletter and lots of local groups (some listed for Annual sub £10 (UK and Irel) £15.00 (Europe) £25 elsewhere by air mail).

**ACC**  
(Amateur Computer Club)  
c/o Rupert Steele  
8 John's College  
Oxford OX1 3JP

also well established and also active – covers all home computers Technical bias Local sub-groups

**National Association of Vic-20 Users**  
c/o 5 Tommervale  
3 Miner Road  
Birwood Nottingham  
**Commodore 64 Independent User Group**  
c/o C Embrey  
11 Saxon Avenue  
Fallowfield Manchester

##### London

**Association of London Computer Clubs**  
11 Compton Road  
London NW1 2PA  
an umbrella organisation for over dozen London-area organisations ALCC organises the London Computer Fair among other things.

**North London Hobby Computer Club**  
c/o Dept of Electronic & Communications Engineering

Polytechnic of North London  
Holloway Road  
London N7 8DB

£30 pa for adults, £8 for unemployed and Poly students.  
Highly organised, lots of subsections including CEM

**ICPUG North London**  
c/o Barry Miles  
Dept of Business Studies  
Polytechnic of North London  
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London N7 8DB

**Vic 20 User Group**  
c/o Jim Chambers  
Dept of Psychology  
University College  
26 Bedford Way  
London WC1

##### Berks

**ICGUP (Slough)**  
c/o Brian Jones  
Slough College of Higher Education  
Wellington Street  
Slough

£4 pa

##### Bucks

**High Wycombe Commodore User Group**  
c/o Richard Onion  
19 Frogmore Close  
Hoghenden Valley  
High Wycombe

£1 pa mostly for Vics.

##### Clywd

**ICPUG Clywd**  
c/o F Jones  
77 Millbank Road  
Rhyl

##### Derby

**ICPUG Derby**  
c/o Ray Davies  
105 Normanton Road  
Derby DE1 2GG

£3 pa includes Vics.

##### Derby Microcomputer Society

c/o F Taylor  
5 Park View Close  
Allerstree  
Derby

£3 pa. Includes Vics and 64s

##### Devon

**ICPUG Devon**  
c/o M Stibbe  
The Lawn  
Lower Woodfield Road  
Torquay

##### Dorset

**Bridport Computer Club**  
c/o M J Higgins  
BBC Transmitting Station  
Rampsgate Down  
Maiden Newton  
Dorchester

– started in January.

**Bournemouth Computer Club**  
c/o Peter Hibbs  
54 Runnymede Avenue  
Bournemouth BH11 9EE

– £5 pa. 100 members includes Vics and 64s subgroup for these

**ICPUG Dorset**  
c/o D Shave  
97 Camford Cliffs Road  
Poole BH13 7EP

##### Dyfed

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c/o F Townsend  
The Hill  
Rhysdown  
Llandysul SA44 4OD

##### Essex

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**Brentwood Microcomputer Club**  
c/o Allan Holland  
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Hutton  
Brentwood CM13 1DA

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**ICPUG Essex**  
c/o Tony Surridge  
97 Shelley Road Chelmsford

##### Gloucestershire

**ICPUG West of England**  
c/o Janet Rich  
Rose Cottage  
20 Old Court  
Springhill Glos GL11 5PF

##### Hampshire

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c/o Ron Gentry  
109 York Road  
Farnborough Hants GU14 6NQ

**Southampton ACC**  
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Gardenways  
Chilworth Tower  
Chilworth Southampton SO1 7JH

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##### Herefordshire

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c/o Brian Granger  
73 Minehead Way  
Stevenage SG1 2HZ

**CRS Home Computer Club**  
c/o Robert Crutchfield  
2 Durham Road  
Stevenage SG1 4HS

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##### Humberside

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**Scunthorpe Computer Club**  
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**Kent**

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36 The Terrace  
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23 Arundel Drive Orpington  
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**North Kent ACC**  
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Caterford London SE6 3AS

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**ICPUG Canterbury**  
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Rosenmoor  
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c/o Mick Ryan  
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Riverhead Sevenoaks

**Lanarkshire**

**ICPUG Lanark**  
c/o A Quin  
Dept of Environmental Studies  
College of Building and Planning  
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**Wirral Microcomputer Users Group**  
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**Middlesex**

**ICPUG West London**  
c/o Geoff Squibb  
108 Teddington Park Road  
Teddington

**Norfolk**

**Vic-20 Cromer**  
c/o J Slaz  
7 Beach Road Cromer  
Club based on local JCPUG branch.

**Northants**

**ICPUC Northants**  
c/o Peter Ashby  
215 Lincoln Way  
Corby  
**Vic-64 Club**  
c/o Peter Wilson  
26 North Cape Walk  
Corby

**Oxfordshire**

**ICPUC**  
c/o J Temple  
"Kirnaburgh"  
Rose Bank  
Bloxham  
**ICPUC**  
c/o J Blyth  
40 Wimbot Close Whitney

**Strathclyde**

**ICPUG Ayr**  
c/o J Shanckland  
2 Strathclyde Place Ayr

**Sussex**

**East Grinstead Computer Club**  
c/o M Wellingspring  
18 Aviary Way  
Crawley Down

**Worcestershire**

**ICPUG South Midlands**  
c/o M Merriman  
13 York Street  
Shropshire-on-Severn

**IRELAND**

**Irish Amateur Computer Club**  
c/o Austin Vaughan  
35 Monastery Drive  
Dublin 22

... has a Commodore section, produces a newsletter

**East Antrim Computer Club**  
c/o David Bohan  
19 Carrickfergus Road  
Carrickfergus  
Co Antrim

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**Commodore Users Group**  
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Espoo 94

**Netherlands**

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**Ireland**

**Vic Club**  
c/o Giuseppe Jacob  
Sardo Giuseppe via Ortenese  
no 8 07100 Lecce

**Denmark**

**CRM Club DK**  
Frederiks Allé 83  
DK-8000 Aarhus C  
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**France**

**Le Club MICRO**  
College Pierre Dubois  
71 rue Victor Bouscels  
53000 Laval  
**Club Vic-20 Commodore 84**  
Leon Brian  
20 rue Leo Desjardins  
92350 Villemomble  
**Microtel**  
87 Route du Polygone  
67100 Strasbourg  
... Includes a Vic section.

**Norway**

**Vic Club**  
Nedre Banksgt 10  
1350 Halden

**Canada**

**Nova Scotia Commodore Computers Users Group**  
Andrew Cornwall  
88 Landrace Crescent  
Dartmouth  
N.S. B2W 2P9

**Vancouver Pet Users Group**  
Membership Secretary  
P.O. Box 9154  
West Vancouver  
British Columbia V7V 3N6

**ELSEWHERE****Mexico**

**Asociacion de Usuarios Commodore**  
c/o Alejandro Lopez Arechaga  
Holbox 174-8 Piso 18 DF

**Korea**

**Commodore Users Club**  
c/o S K Cha  
KPO Box 1437 Seoul

**South Africa**

**Pretoria Commodore Computer Club**  
c/o F Jordan  
61 Monument Avenue  
Lytham Manor Pretoria 0140

**Toronto Pet Users Group**  
Membership Secretary  
Dept C  
1912 A Avenue Road  
Suite 1  
Toronto MSM 4A1

**CCCC**  
Roger Olson  
c/o Stoney Commodore  
47 Coachwood Place  
Calgary Alberta T3H 1E1

**VIC-TIMS**  
Greg Goss  
2-830 Helena Street  
Trail  
British Columbia V1R 3X3  
**Bonnyville Vic Cursors**  
Ed Winchen  
Box 2100  
Bonnyville Alberta T0A 0L0

**New Zealand**

**Nelson Vic Users Group**  
c/o Peter Archer  
PO Box 860 Nelson

**Commodore Users Group**  
c/o Roger Allens  
VHF Clubrooms  
Hasel Avenue  
Mount Roskill

**Australia**

**Wonthaggi Computer Club**  
c/o Bert Tisser  
53 Wentworth Road  
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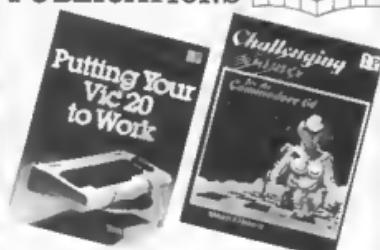
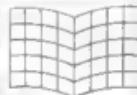
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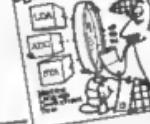
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## The Commodore 64 Program Book



### The Book:

The Author:  
The Publisher:  
Price:  
The Reviewer:  
The Conclusion:

The Commodore 64 Program Book  
Vince Apps  
Phoenix Publishing  
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This claims to be "THE Commodore 64 Program Book, with something for everyone ... a blockbuster collection".

Well, for the reasonable price of £4.95 this 122-page paperback offers 25 programs to type in. They range from adventure games, 'arcade' games, and a flight simulator; to mines, an educational Capital Cities quiz and a machine-code assembler/dissassembler. The forward tells us why "we" wrote the book; since when do programmers use the royal plural?

The format of each program is sensible: a brief description of what it does, how to use it, line-by-line lists of graphics characters used and what the various routines do (like "re laser and check for hit") and finally the program itself, dumped directly to a Commodore printer – on balance a wise choice, eliminating the possibility of printer errors though at the expense of some legibility and the use of the Commodore control-code Mnemonics.

The programs fall into logical batches. First are the two adventure games – *Forbidden City* and *Pharaoh's Curse*. Although they take input only in the simple verb/noun format they do have the useful save-game feature for when you have to surrender the family TV set! You can then reload the data when you next come to play and continue from where you left off.

Dedicated Adventurers should be able to solve either adventure in less time than it took to type in – they are by far the largest programs in the book.

(Most) readers will be glad to hear that there is the usual complement of arcade-type games. These include such (original?) games as *Bomber*, *Breakout*, and *Lunar Lander*. In honesty, they are quite good: colour, sound, sprites and collision shapes are all used – some games using all four. The mod didn't do the 64 justice, though; it is capable of far more than these programs asked of it. Also, being in Basic, some games were painfully slow.

Another 'game' is *Capital*, a very simple "name the city" game (if anyone could write within a few weeks of beginning to program). Similarly simple programs were *Metric Converter*, *Quek Book* and *Binary to Decimal Converter*. A rather disappointing line-renumber program was given – it does not remember GOTOs or GOSUBs, so thoughts of being spared the tedious task of manual renumbering are dashed!

Anagram is a simple program which jumbles up the letters of words held in DATA statements and prompts the user to guess what the word should be. Instructions for expanding the vocabulary are included, though the data in the program as it stands is large and varied. Obviously parents could add a simpler list of words for young children; or, with suitable vocabulary, it could make an interesting party game.

*Morse Code* is a useful program which will transmit either a jumble of random letters, a word chosen from its vocabulary at random or a message inputted by the user. I must admit rather liking this program in all its simplicity.

Last, there's a useful utility simply called *Machine Code* which combines the functions of an assembler/dissassembler with the useful features of save/load machine code; it also lets you examine memory, run machine code and move memory block. This would have been an excellent program ... but for a few (major) faults.

The most important of these is the fact that it does not use standard 6502/6510 mnemonics. Instead the program employs an unwieldy system of the author's own concoction, where the normal three letters (i.e. LDA ADC) must be followed by the letters IM if the operand is immediate (i.e. LDA #\$3C), Z if Zero page is to be used and X, Y, ZX or ZY if the operation is to be indexed with the X or Y register. And there's more – the program operates in decimal, not hex, so LDA\$22, Y would become LDAZY 34!

Anybody who knows 6502/6510 mnemonics will have great difficulty in adapting this system. For those brave enough to do so though, it offers use of (one-letter) labels; and a short sample program is given which shifts the screen one place to the left.

**Overall opinion of the book?** None of the programs were up to commercial standard – but then at the price you couldn't expect them to be. I think the most accurate description I can give of the programs is 'magazine standard' – that is, less than commercial quality but nevertheless worth having.

Twenty-five programs for less than the price of a normal commercial program is good value; and somebody learning programming could take them apart one by one to reach a good understanding of many Basic concepts.



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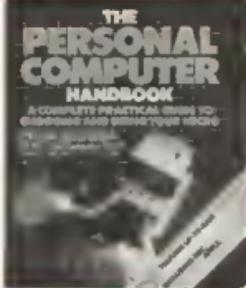
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## The Personal Computer Handbook



### The Book:

**The Author:**  
Peter Rodwell  
**The Publisher:**  
Dorling Kindersley  
**The Price:**  
£12.99 paperback, £13.99 hardback

**The Reviewer:**  
Rohdin Iscolak

### The Personal Computer Handbook

Peter Rodwell  
Dorling Kindersley  
£12.99 paperback, £13.99  
hardback  
Good book, shame about the  
price (and the [dk.com](http://www.dk.com)  
portion)

General books on home computing are usually written from a standard recipe: a potted history of the computer and a simple description of the way it works. Sometimes a few more ingredients are sprinkled around to make the book worthwhile.

The Personal Computer Handbook, not surprisingly, has been cooked up in much the same way. But Peter Rodwell, its author, has tried to be more concise and more practical and so he should - he's the last editor but one of Personal Computer World magazine. So has this more exhaustive approach delivered a spicier and more satisfying book?

The book's outward appearance alone encourages you to browse through it, that's if you're not averse to the now obligatory cover shot of junior teaching Dad how to compute. It's a large book (about the size of a Beano annual); and is bright, colourful, lavishly illustrated with photos and detailed drawings; and the print is clear and bold.

The chapters, or 'modules' as the author prefers to call them (yuk!), are colour-coded and self-contained so you can dip into any part at leisure. You're helped by an meticulous system of cross-referencing. If you're reading about computer memory, for example, the mention of logic gates refers you back to the appropriate module.

Another clever and useful feature is the way main text is kept separate from its illustrations and their captions. The captions generally expand on the text so you could speed along or stop and take advantage of the greater depth offered.

In the book does have an overall structure, it falls neatly into six parts each with an introduction that exams over the main issues. That may not be useful to computer bulls but the history of computing it contains certainly is worth sipping. It's concise and has some marvellous photos - like the one of Charles Molesworth's Difference Engine, that improbable and ultimately useless pile of metal. All the great computer intellects are here, most of them with funny names - like Hollerith, Scheutz and Vannevar Bush.

The sections on how computers work will be equally gripping for the uninitiated. Again, it uses illustrations to add substantially to our understanding. Like many explanations of a computer's innards, this one doesn't attempt a gloss over difficult concepts. They remain difficult - logic gates, the central processor, memory, memory et al. All are discussed with a clarity and precision that impresses the reader among computer writers.

The same goes for the modules on hardware and software. If you couldn't visualise the complexity of a Z80 chip say, you'll see it exploded to the size of a table-mat and find out how it's made into the bargain. Likewise, there's a lot of cutaway drawings so you can 'see' inside a diskdrive or a cartridge. That may be valuable merely if it stops you opening the real thing and watching in horror as all the bits fall irretrievably out.

A real practical section is the one on BASIC programming. It gives not only a flavour of the language but also examples of loops, arrays and suchlike. For the more experienced, there's a discussion of more advanced languages like Pascal, C, Logo, Forth and examples of the type of programs they produce. The same goes for operating systems. Rodwell answers those nagging questions about why software won't run on certain machines and why some operating systems are better than others.

Those are the plus points, but there are a few dubious areas in this book. Why devote a chapter to the basics of setting up a computer when the machine's manual would surely cover those points - and do so more specifically, too? (Incidentally Rodwell uses the Sinclair Spectrum as an example throughout.)

Neither are there any real revelations in the section supposedly devoted to the future of computers - a great deal of time is spent talking about swanning technologies like video and compact disks. The section on choosing a computer is equally unedifying there is some sound yet diluted advice but Rodwell goes on to give a selection of the more popular micros many of which are already out of date. Such is the nature of computing; but Peter Rodwell is of all people should know that if this book is to have lasting value, better stick to less ephemeral areas.

Learning about computers is a process of stripping away darkness. But there are always some niggling black patches that remain. Rodwell tries to give a rounded picture, and succeeds very well. His style is lucid - perhaps a little dry, but the copious illustrations make up for that.

Some sections, though, amount to mere padding. Others, like the descriptions of applications software for business, may be relevant to only a few readers. But maybe that's the price you pay for completeness.

Moneywise, the price you pay looks a bit high for an all-purpose introduction. It's buying some very good presentation, layout and illustrations and an balance, it's worth paying for.

BOOK 1.00K

BOOK 1.00K

# BOOK

## The Commodore 64 Handbook

**The Book:****The Authors:****The Publisher:****The Price:****The Reviewer:****The Conclusion:****The Commodore 64 Handbook**

Peter Lupton and Frazer Robinson

Century Publishing Co

£5.95

Simon Potter

Not a handbook, but an uninspiringly ok introduction

Book jacket blurbs and titles are becoming debased: you know full well that the book probably won't help you 'get the most from your 64', or it won't be an all-you-need-to-know 'handbook', instead it'll be another supplement to the 64's manual, introducing the 64 and expanding on those bits the manual glosses over.

The best you can hope for is that it will give you some extra information, or that it will help you quickly to locate some (act) you need, or that it will demonstrate the use of the 64 and the commands available (a tanner to anyone who can tell me how, why, when and where to use WAIT).

And so to *The Commodore 64 Handbook*. Now, let's be viciously literal. A handbook it seems to me should be a handy compendium: it should tell you all you might want to know (and I do mean all), and it should do so in a useful and useable fashion.

Strike one for Messrs Lupton and Robinson. They've written yet another 'beginner's guide to the 64' that goes a bit further than the manual, as such it's not a bad try. A bit me-too in its nature and not particularly lively in its style but still adequate. There are some oddities of construction, given that it is for novices, like the tuning screw at the back of the 64 is identified in the caption to a diagram (most 64 books ignore it) but the thing isn't mentioned at all in the section on tuning. You're told all about variables and arrays (heavy stuff for page 27, but quite well explained) before you're introduced to the use of cassettes (all part of the basics, surely). The TI clock, a genial extra in the 64, is introduced before the fundamental stuff like subroutines. And so on.

At the other end of the book are the usual appendices, most of them apparently reprinted on cassette from the 64 manual. Which you'll have with your 64 anyway. To my mind, appendices should give additional information, why not a decent memory map, at the very least?

If you were writing a book about the 64, you'd almost certainly call it 'Getting the most from the 64' or 'The 64 Handbook'. That at least seems to be the obvious conclusion from the flood of Commodore books hurtling like lemmings from the world's publishers. There are so many, in fact,

that the average reader could well be forgiven for ignoring the claims in the title.

More seriously, the book has two significant deficiencies as a reference. The authors simply haven't presented their information in an easy-to-use reference form (though end-of-chapter summaries and a decent index do give a nod in that direction). They haven't covered everything: nothing about disks and printers, for instance, nothing about off-the-shelf packages either.

And sometimes what they do cover is cursory in the extreme. CMD is mentioned only in passing, and there's nothing about the alternative use of CMC or PRINT# in addressing I/O channels. You get a mere five pages in Chapter 16 on 'Advanced Techniques', though truth to tell it does contain a plug for something called 'The Advanced Commodore 64 Handbook'. Anyhow, advanced techniques in question are machine-code subroutines (a mere five helpful mention of SYS and USR); there's half a page on WAIT that consists of saying the command is unnecessary and there's a couple of pages on 'designing good programs' which means defining 'structured programming', avoids the use of some forethought, and omits any explanation of floating-point arithmetic.

What's worse, the book falls into the style of so many 64 books. Most of the examples are mathematical and many are positionally messy: there must be a better way of illustrating loops and decisions than a long program that sets numbers in ascending order. Which leads on to a major criticism: like most 64 books, that one tells you lots about BASIC commands without explaining how, why and where you might actually want to use them.

The authors can't have it both ways: either the book is a reference handbook or it's a beginner's introduction. It succeeds as neither. As an introduction to the 64, it's no worse and no better than a dozen alternatives: good sections on graphics and sprites, for instance, but ditto on sound.

Get the idea? Well, don't bother getting the book - not if you want to use it as a genuine handbook. As an intro, it'll do as well as any until something really good comes along.



# CHARTS

## VIC 20 TOP 20

1	◆	Crazy Kong	Interceptor
2	◆	Jet Pac	Ultimate
3	◆	Wiz and Princess	Melbourne
4	◆	Hell Gate	Llamasoft
5	◆	Snooker	Visions
6	NE	Sub Commander	Thorn
7	◆	Sargon II Chess	Commodore
8	◆	Flight 01S	Ferranti
9	NE	Scramble	Terminal
10	NE	Chariot Race	Microantics
11	◆	Emmet Attack	Commodore
12	◆	Metagalactic Llamas	Llamasoft
13	NE	Dam Buster	Rabbit
14	◆	Arcadia	Imagine
15	RE	Matrix	Llamasoft
16	◆	Paratrooper	Rabbit
17	NE	Space Swarm	Soft Projects
18	◆	Gridrunner	Llamasoft
19	◆	Skyhawk	Quicksilva
20	NE	Mine Madness	Thorn

### TOP 5 MANUFACTURERS:

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INTERCEPTOR  
ANIROG  
OCEAN  
COMMODORE  
IMAGINE

An independent directory of best selling games, compiled by R.A.M.C. for Commodore User, representing retail sales for preceding 4 weeks. Data drawn primarily from independent specialist computer outlets.

## CBM 64 TOP 20

1	◆	Space Pilot	
2	◆	Manic Miner	Soft Proj...
3	◆	Hunchback	Ocea...
4	◆	Scuba Dive	Martech/Dur...
5	◆	Chinese Juggler	Ocea...
6	◆	Pilot 64	Abbe...
7	◆	Forbidden Forest	Com...
8	NE	International Football	Commod...
9	◆	Revenge of M'C's	Llamasof...
10	NE	Quick Thinking	Llamasof...
11	NE	Aztec Challenge	Mirrorsol...
12	RF	Hovver Bovver	Com...
13	NE	Colossus Chess	Llamasof...
14	NE	Speed Duel 64	CD...
15	◆	Metagalactic Llamas	DK Trome...
16	◆	Boogaboo the Flea	Llamasof...
17	NE	Ugh!	Quicksilv...
18	◆	Super Pipeline	Softtek...
19	◆	China Miner	Tasket...
20	NE	Splat 64	Interceptor...

### TOP 5 MANUFACTURERS:

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ANIROG  
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INTERCEPTOR  
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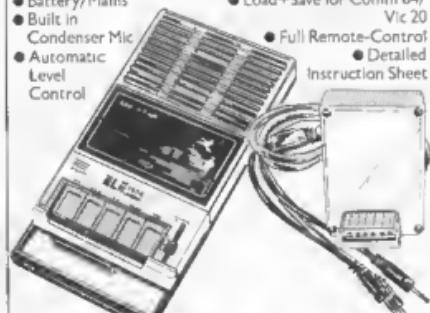
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# Picking on Paramount

## Bright ideas and bushy tails versus the money machine

by Bohdan Buciak

Paramount still thinks it can make a splash before the tide goes out. It is majoring on Commodore machines, has a small range of good games - and has acquired the obligatory teenage-guru programmer. With that lot, it confidently expects to turn over £1 million in its first year. Bohdan Buciak trekked to Teesside for a chat with Paramount's protegeons.

Paramount lives in a modest row of terraced shops in the modest town of Stockton-on-Tees. Across the road is the railway station, from which Stephenson's Rocket used to trundle up the tracks to Darlington. Stockton is proud of that.

But Bob Horsham and John Chapman, Paramount's joint founders, aren't Stockton men, they're both from Yorkshires, and in the true brass-bean-muck tradition they both describe themselves as entrepreneurs of sorts.

"My whole experience is in marketing and promotion - promoting people." The middle-aged Horsham reels off a list of areas he's worked in, jewelry and bullion, discos and clubs. Perhaps not the best pedigree on which to enter the specialised and often cut-throat software industry?

Chapman to the rescue. "But we're both natural businessmen and we know that if there's room for one there's room for another." That sounds pretty casual but a good deal of preliminary research was done, mainly by Bob Horsham ("I was having a lazy period - things weren't going too well for me in business"). Horsham found himself with plenty of spare time to look for new areas in which to exercise his promotional skills. "The idea of computers began to hook me and I knew there was an opportunity there if only I could find it."

### Promotional Ideas

He thinks he did find it, his idea being to promote game programmers as personalities. "I reckoned you could have an Elvis Presley of leisure software programming" (Horsham prefers "lesser" to "games" software - but

more about that later.) "It was difficult to get my concept of promoting programmers over at the time - and John Chapman thought I was crazy." Of course, it's easier to swallow those ideas now that the likes of Geoff Minter and Eugene Evans have reached cult-figure status.

At the same time Horsham bought a Vic and then a 64; and he decided those were the best machines to write for - perhaps not from the technical viewpoint, but certainly in terms of selling prospects.

Horsham and Chapman duly combined forces and moved to Stockton where the latter had most of his business interests. But that wasn't their main reason for settling on Teesside: "We knew that Teesside Polytechnic had a good reputation for turning out computer people and the area was totally unexploited. So we placed advertisements for programmers in the local press."

They formed Workstations, a consultancy operation that arranged for ghost writers to work for already established

software houses. It seemed natural from there to go one step further and form a software house of their own. "We chose to call it 'Paramount' - sounded suitably impressive."

Setting up Paramount enabled Bob Horsham to pursue his dream of promoting and managing a genius programmer: "we interviewed a lot of people." Most were youngsters who, according to Horsham, wouldn't or couldn't fit in with his plans. "I wasted an old head on young shoulders, somebody who could be successfully managed."

### A star is born

Paramount eventually found their programmers. Only one of them looked to Horsham to have star potential - a sixteen-year-old school leaver with the unlikely name of Jason Bonham.

Jason started work on the Vic and produced Outback, an original yet somewhat bizarre game featuring the likes of swagmen and kangaroos. That was Paramount's first product - it

appeared last November. Since then, Jason has written Jumper (a "Frogger" clone for keep-fit enthusiasts that seems to sell despite the longevity of the basic idea) and Chocabloc; also for the Vic. For the 64, he's converted Outback and written Megawar. That amounts to all but one of Paramount's current title range - pretty good going.

Jason had to accustom himself to Paramount's ways of working. His first version of Outback wasn't accepted straight away. Both Horsham and Chapman made suggestions which, fortunately, Jason was able to implement himself. Countdown (the only Commodore game Jason hasn't written) was different; the teenager who'd originally submitted the program couldn't revamp it himself.

That was where the technical expertise available at Teesside Poly came in. "We employ computer scientists on a freelance basis to modify programs and give advice," says Horsham. So why don't these people write their own



Just what the world needs, another games company. Paramount Software is pretty small and pretty young compared with the giants of the games software industry, who started shovelling out games and shovelling in the money a long time ago (which means all of two or three years). Now, the games market is reaching saturation point and it looks as though only the large concerns with the financial muscle will come out winners - money matters like 'distribution' and 'marketing' count more than the quality of games in this business.



programs? "Computer scientists have a lot of routines but don't tend to have finished programs." What he's saying is that the youngsters usually have the original concepts, the creativity, but they may lack the technical ability, the logic or even the patience to turn that idea into a good game. And equally, that the established computer professional may be able to do it right - but lacks the original ideas.

Paramount is keen for local programmers to come in and get their work assessed. It's now raising alterations to its modest offer to accommodate them. But kids aren't given the opportunity to discuss their work with technical experts. "We can't send kids away with development ideas because that's chucking out our commercial secrets," confides Chapman.

That's followed by "We find they don't get on anyway - kids don't seem to be motivated by the really technical stuff". That may or may not be true. Youngsters could certainly benefit from talking to the experts. But there is a premium on originality in the software industry. Letting secrets go is bad business - even if it does sound a little callous.

So the premise is that the youngsters will have the kernel of an idea and Paramount will mould it. "We know what we want the finished product to be but not how to do it. Sometimes we make demands that technically can't be met. But it's always a team effort." Jason has probably experienced that way of working more than most.

### Rich pickings

Bob Horsham has strong views on that team-spirited idea. "I can only work with people who are willing to be managed, work with me, we can work towards a



common aim on a long-term basis" (that aim is obviously wealth for all concerned).

It might sound as though Horsham is interested only in people who will do as they're told. He denies that strongly and points to the often deluded get-rich-quick visions youngsters seem to have about the games software industry. He's probably trying to be more cautious when he makes the admonition, "you don't make a fortune overnight". Even if some people demonstrably have done just that.

So what kind of money do programmers make at Paramount? The company generally employs them on a freelance basis and they receive only a royalty on sales. That lies between 10 and 20 per cent, depending on how much development was done by Paramount on the original idea. Jason, being the company's whiz kid, is paid a fee but he's not rolling in money.

So Jason's had to put aside ideas (if he ever had them) of quick bucks on the Eugene

Evans scale. He probably works hard and has to undergo the additional strain of changing from the Vic to the 64. "That was the make-or-break period of our relationship," remembers Horsham. "We tried to give him a lot of backing and spent a great deal of time at his house."

While Jason was struggling with the 64 version of Outback, Horsham suggested he take a break and work on something else. That was how Megawatt appeared - a somewhat clesser version of those spaceship zapping games. And like Jason's other games, it has received good reviews in the computer press. It's also become Paramount's best-selling product with sales of 60,000 expected by the end of April.

### Getting noticed

A string of good reviews have doubtless been a boon to Paramount. But despite Jason's talent, if those games don't appear in the shops the customer won't be able to buy them and Paramount makes no money. But

there's the paradox that dealers won't stock you unless somebody else is stocking you. So how does a small company get itself noticed and its products on the High Street?

One answer for Paramount might have been mail-order. But Horsham recognises that the bottom has fallen out of that - and so has customer confidence. Too many software houses in the past have 'forgotten' to meet their customers' orders.

In any case, you don't sell many games that way. And he wants to sell a lot of games. So Horsham has a sales force of three; they travel the country visiting as many dealers as possible. That's backed up with an advertising campaign in the computer press.

"At the beginning, we got the usual 'what, another one?' response from dealers. But when they actually see our products demonstrated, they invariably stock them."

With stocks in plenty of dealers' shops, Horsham was armed with more clout with which to contact distributors and

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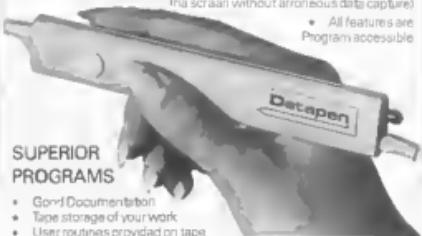
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## The Commodore User Profile

one of the national chain-stores. Of course, that's where the big men start, distributors buy in bulk and guarantee to get your tape into a large number of shops - on the national basis. "Safeway, Pilcoman and Webers now distribute us. We're in Boots and Menees too, so to get there, we had to bombard them with reviews, demos and reports from customers."

There's a price to be paid for selling in bulk to chain-stores or to distributors. Both expect large discounts, the latter taking as much as 30 to 60 per cent of the tape's retail price.

Paramount's games are selling well. But both Horsham and Chapman realise that to be successful, their games must continue to be original, and they must push further towards the computer's technical limits.

"We're constantly looking at other people's games, especially those new on the market, to assess the State of the Art."

Horsham says that recent games change from large concerns have left him cold - "Taskset is the only other software house we're watching closely". That company happens to specialise in games for the 64 (Super Pipeline and Jammin' now appear at the top of the 64 pop-lots).

### Developments

Paramount is characteristically slyer about its new game developments. Apart from securing someone to rewrite existing games for other machines, the Spectrum in particular, it's looking for what Chapman calls "vastly more complex games". What that amounts to is he loathes to reveal, except: "we're developing a Commodore 64 game that uses 64, about 12K more than the machine's useable RAM, by going into its dark corners."

>Loading such a lengthy game on tape will probably tax your patience. So providing games on floppy disk, as the likes of Isis Laser and Audiogenic are already doing, may be a good (and necessary) idea? "At present it costs more and we'd like to pass that on to the

customer. But we will be manufacturing disk-based games by the end of this year."

Will the games market in its present form last that long? Both Horsham and Chapman have strong views on that. "Leisure time is going to increase," observes Chapman (he doesn't like the word 'unemployment')

so far, and it's not worth selling on the basis we've seen. It will take us a long time to dig out and produce our own. And, at present, we just haven't got the time." It's a matter of priorities, Horsham would rather open up overseas sales of existing products than diversify into uncharted red waters.

... produce games for the Vic because it's got such a large user base. "And the 64? It's absolutely first class - ideal for what we want."

### Master plan

And what Paramount wants, according to Horsham, is to be in "the business of winners. Unlike the rest, we don't produce one good game and a load of bad ones. We have only eight games and they're all good." Which is for you, the customer, to decide. But what he's saying is that going for quality rather than quantity makes better business sense.

Horsham's idea of winning is linked to his idea of promoting and managing personalities.

"Two or three of our programmers will become Big Names - one of them will be Jason Benham. He knows that everything we said would happen has happened." Not too surprising since Horsham now manages Jason's affairs personally.

"As of now," he enthuses, "Jason will be getting gradual and co-ordinated exposure in the media as a whole, in magazines, radio and ultimately on television". But is Jason ready for the likes of Terry Wogan? And what will he actually do under the bright lights? Horsham has no doubt on either count.

"We don't want to push him out too soon. So we've gradually involved him in a pseudo-social life and people have noticed that he's coming out of his shell. Outback and Megawars have also given him a great deal of confidence. You can't promote a guy unless he's going to be able to do something - we see Jason contributing to computer magazines and computer programmes on both radio and TV" - all this, he hastens to add, with complete parental consent.

In the short space of time Paramount has existed, Horsham has laid the foundations for his Plan and he's confident that the youthful Jason Benham will fulfill the promises made to him. "Jason's got the ability to understand exactly what I'm after; he has the original concepts but he can also listen to what I'm saying. As a result, he's achieved what I consider to be the ultimate in programming." So Jason's future stardom is assured? In any case, whatever the excesses he grabs, it looks as though he'll achieve it the Horsham way.



"and people will require something to do that is not only leisure but constructive". That's why they prefer 'leisure to 'games as a description for their work.

Over to Horsham: "We realise that the market is diversifying into home and educational software. But we're not impressed with what's available

Whatever the software, though, Paramount is staying with the Vic and 64 as its main machines - and probably with any future machine Commodore decides to launch. The Vic is already beginning to suffer from a scarcity of new games. But Horsham is sticking with it, and says his Vic games are selling well: "we will continue to

# Basic Style – Program Evolution

by Jim Butterfield

Sometimes you see programs that are so crisp and neat that you wonder how the programmer's mind can be so orderly. The code comes out in an elegant incisive style. Every line zeros in on exactly the right thing to do.

How does a programmer develop such a style? Why can't you write like that? Sometimes a lowly hacker can feel inferior when facing such immaculate programming style. Yet the code you see is often a matter of evolution – rewriting and tidying up. It's not always written that way from the beginning.

I have been accused of writing 'squeaky clean' programs. It seems to me that you might like to see how my murky first programs get reworked and tightened up into their final version. It seems to me that in some ways, programming style isn't what you write (at least at first) – it's knowing what to look for when you clean up.

I need to do an almost trivial job – list a file from disk to the printer.

I had a minor extra to do. I wanted individual pages, so that the lines needed to be counted, I needed a title on each page, and at the end of the run, for the sake of neatness, I wanted the printer to eject the page.

It's not a demanding task, but I'd like to show you how I went about it. In particular, even a simple job like that can be revised and tightened up extensively.

Here's my first program. I'll talk my way through the listing.

100 OPEN 4,3

Open file number four to the screen. Why? So I can send the program's output to the screen and see that it's working right. After the program looks good, I'll change the above line to OPEN 4,4

105 OPEN 1,8,3,"CONTROL"

That's my input file to be listed.

```
110 REM start of page
120 FOR J=1 TO 2: PRINT#4:L=L+1 NEXT J
130 PRINT#, " title " ;L=L+1
140 PRINT#4:L=L+1
```

This prints the page title. I know I'll come back here for each new page, so I'm placing a REM statement here to mark the place. I rigorously add TO the line count, L, each time I print a line.

```
150 INPUT#1,A$:SW=ST
170 PRINT#4,A$:L=L+1
```

Here's where I input from disk and output (to the screen first, later to the printer). I need to save the value of ST (the status variable) so that later I can check to see if this is the last line from the file. ST will be changed by the PRINT# command – so I save its input value in variable SW.

```
180 IF L<65 GOTO 250
190 IF L=65 THEN L=0:GOTO 250
200 PRINT#4:L=L+1:GOTO 190
```

If I have printed the maximum number of lines desired, I want to eject the paper by printing until the line count L equals 65. Since each page has 65 lines, I'm now at the start of the next page and can set L back to zero.

250 IF SW>0 GOTO 300

260 IF L=0 GOTO 110

270 GOTO 150

If I'm at the end of the input file (SW=0) I'll go to line 300 and wind things up. Otherwise, I want to go back.

Here's a cute touch – perhaps too cute for some tastes. Variable L can only be equal to zero if I've just ejected a page. If not, get another line from the input file starting at line 150.

300 IF L>0 GOTO 190

Here's a super-cute trick I pondered this one for a while, since it's almost too clever; that sort of thing can trip your coding up. Here's the objective: if we're finished, but the paper hasn't been ejected, get back to line 190 and eject the paper. The coding will come back here again, but this time variable L will be zero and we can finish the job by closing the files.

310 CLOSE 1

320 CLOSE 4

That's it. It's really rather messy coding. It works, and for a temporary job that's all we would need.

But it doesn't "feel" right. The code feels messy: it seems to jump around and I don't get a feeling of smoothness in the program. It's time to pack at the coding.

## First revision

The first awkward spot is around lines 190 and 300. The code to eject the paper works but looks clumsy. Besides, we call it twice (once at 65 lines, and again at end of file).

I have feelings about this part of the code, too. It's a 'trust to do a particular job'. I would feel better moving it to a separate subroutine where it can stand out as an identifiable action. Sometimes I extract code into a subroutine and then move it back later; it helps me identify the 'modules' that make up the program.

Let's move the eject routine to a subroutine at line 500, clean up a bit, and see what we get. We can see that the GOTO 250 on line 190 is now redundant since we'll go there anyway. But we have other things to do. We're still trimming the program, and have some distance to go yet!

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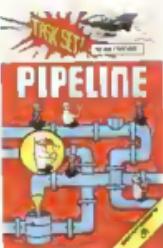
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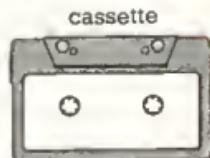
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```

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105 OPEN 1,0,3,"CONTROL"
110 REM start of page
120 FOR J=1 TO 2:PRINT#4:L=L+1:NEXT J
130 PRINT#4," title "L=L+1
140 PRINT#4:L=L+1
150 INPUT#1,AS:SW=ST
170 PRINT#4,AS:L=L+1
180 IF L<62 GOTO 250
190 GOSUB 500:GOTO 250
250 IF SW<>0 GOTO 300
260 IF L=0 GOTO 110
270 GOTO 150
300 IF L<>0 GOTO 190
310 CLOSE 1

```

### Digging deeper

Around lines 250 to 300, we jump around a lot: we have one jump forward to 300 and two jumps back to 110 or 150. The logic seems scattered.

I have a thumb rule about loops: I like to see them neatly nested, with short jumps entirely within longer jumps. It might even be summarized as a rule-of-thumb: where possible, make short jumps as short as possible.

Using this rule, I want to get the loop back to 150 into logical order first. Then we'll work in the longer loop to 10 and finally the forward branch to 300. We'll need to expand the logic using an AND operator, but that's not too hard.

As the coding is written, certain logical things start to fall together. For example, we don't have to GOTO forward to line 300... when we're finished writing the two loops, we'll fall into 300 naturally. ('Naturally' seems to be a key word in how programs seem to come together as you tighten them up.)

We can also tighten up the page eject conditions. If we write line 160 correctly, there will be no need to go back to get a page ejection. One option would call the subroutine at line 500 twice. But if we think of what our objective really is at line 160, we can do it all correctly the first time through: inverting the logic and adding an OR connective does the trick nicely.

Look at how far the original program has come.

```

100 OPEN 4,4
105 OPEN 1,0,3,"CONTROL"
110 REM start of page
120 FOR J=1 TO 2:PRINT#4:L=L+1:NEXT J
130 PRINT#4," title "L=L+1
140 PRINT#4:L=L+1
150 INPUT#1,AS:SW=ST
170 PRINT#4,AS:L=L+1
180 IF L>61 OR SW<>0 THEN GOSUB 500
250 IF SW=0 and L=0 GOTO 110
260 IF SW=0 GOTO 110
310 CLOSE 1
320 CLOSE 4
330 END
500 FOR J=L TO 0:PRINT#4:NEXT J
510 L=0:RETURN

```

This is pleasing... but we can do even more. The repeated SW=0 test in lines 250 and 260 still irks a little: it seems clumsy. The whole business is tied up with whether to print a title or not. Is there a better way? Could the test of L>0 be somehow shuttled up to the top of the loop instead of sitting at the bottom?

While we're thinking about it, the whole business of printing a header is really a module: we must do the whole thing title and all, or nothing. If we move it out to a subroutine, we might see the logic flow more clearly. Let's do it and work on the logic flow. We end up with this.

```

100 OPEN 4,3
105 OPEN 1,0,3,"CONTROL"
110 IF L=0 THEN GOSUB 500
150 INPUT#1,AS:SW=ST
170 PRINT#4,AS:L=L+1
180 IF L>61 OR SW<>0 THEN GOSUB 500
250 IF SW=0 GOTO 110
310 CLOSE 1
320 CLOSE 4
330 END
500 FOR J=L TO 0:PRINT#4:NEXT J
510 L=0:RETURN
600 FOR J=1 TO 2:PRINT#4:L=L+1:NEXT J
610 PRINT#4," title "L=L+1
620 PRINT#4:L=L+1
630 RETURN

```

Look at the main code from lines 100 to 330. It now seems tight and concise like a finely tuned instrument.

Both subroutines at lines 500 and 600 are called only once. If it seems important, we could put them back into the main coding stream. But I'm happy to see them as clearly isolated modules. At this stage I would add comments (line 499 REM PAGE EJECT and line 599 REM TITLE PAGE) to neaten things up.

### Moral

First: what you see published is not always the first coding idea that popped into the author's head. The programmer is not always smarter than you. But more time has been taken grooming the program into its final shape. When many people are going to read your code you like to take a few extra pains with its appearance.

Second: don't be afraid to revise your programs, even if they work correctly. Sure, a one-shot program often doesn't warrant picking over, use it and forget it. But sometimes the exercise can reveal almost accidentally powerful and effective ways of coding.

Third: 'style' isn't an inborn talent that some people have and some don't. You learn it as you go. Some things you will discover for yourself, and others you'll pick up by looking at other people's coding.

The odd thing is that we instinctively recognize better coding when we have written it. You may not know exactly why, but you often feel good about a certain piece of programming. Usually, it's because it has 'style'. But remember that style isn't a matter of luck. You can get it by working for it.

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# TOMMY'S TIPS

Tommy is Commodore User's resident know-all. Each month he burrows through a mountain of readers' mail and emerges with a handful of choice queries. The result, before you, is a wad of priceless information and indispensable advice. There's even the odd useful tip as well.



Dear Tommy, I am at the end of my tether. It seems that I am really unable to get an answer from Commodore to my problem. I have a Vic-20 and a Brother CE50 Electronic Daisylane Typewriter plus its IF50 interface and its CA50-5 cable set (the machine accepts RS232 or Centronics). The lead has a D-type 25-pin plug; the Vic does not. How do I pass the Vic-20 in RS232 to drive my word processing equipment? Why isn't Commodore telling us more about the RS232 of the Vic, or is it all a filthy lie?

Before you can connect a printer to the Vic using an RS232 link, you need an RS232 adapter for the Vic. Surprised? Well, the Vic does not really have an RS232 port - it's so-called RS232 port is software-compatible with RS232, but it needs some extra hardware to convert the Vic's signals to the different voltage range required.

Stack (among others) does a very good interface. Unfortunately buying one of these means your problems have now only just started, because very few hardware manufacturers implement the complete RS232 specification, except for full communications devices like modems. Instead, each company takes what it considers to be a reasonable subset of the standard. The result? Trying to connect two different devices, each using a different subset of full RS232, can be an absolute nightmare.

In addition, some printers use special characters sent up and down the line to tell the computer when they are unable to accept any more data (printers are very much slower than computers and so the Vic needs to stop every so often to allow the printer to catch up).

Now, the cable you already have may well work if not, hopefully, the interface manufacturer may be able to give you the required connections if you can send him the details of the Brother Interface. But don't expect it to work first time, unless you can find somebody else who has successfully connected

interface manufacturer may be able to give you the required connections if you can send him the details of the Brother Interface. But don't expect it to work first time, unless you can find somebody else who has successfully connected the same printer to a Vic. It can take even an expert some fiddling to get an RS232 link working properly, and trying to do it by post is much more difficult!

Dear Tommy, The display on my 64 is flickering whenever the computer is parked in an INPUT or a WAIT or similar endless loop. Small twinkles appear around characters like 'D', 'E' and 'F', although the rest appear normal. But if the character set is moved to RAM, all characters appear normal and without flicker. What could be the cause of that?

The 64 also seems to have a strange bug. Press both cursor control keys permanently and then press the left-hand shift key. You should then be able to observe some spades on the screen, if yours has the same bug.

The first problem sounds like a hardware fault, but it is very difficult to think of a cause without having the machine look at it. It sounds as though maybe the character generator is borderline. It is unlikely to be a serious problem though.

Your second point is something I had not noticed before - presumably it is something to do with the keyboard decoding on the 64 special characters sent up and down the line to tell the computer when they are unable to accept any more data (printers are very much slower than computers and so the Vic needs to stop every so often to allow the printer to catch up).

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the same printer to a Vic. It can take even an expert some fiddling to get an RS232 link working properly, and trying to do it by post is much more difficult!

Dear Tommy, I have been trying to write a 'Monopoly' program for my 16K Vic. The information about each street, rent, price of houses etc is stored in DATA statements - for example:

```
10 DATA 200,0,0,0,0,0,GO
20 DATA
 0,2,10,30,90,160,250,50,OLD
  KENT RD
```

These lines are perfectly legal as far as I can see, but when I run the line

```
1000 READ
  D(I),P1(I),P2(I),LP3(I),P4(I)
  ,PS5(I),P6(I),SE(I)
```

I get a SYNTAX ERROR. Why?

Now for something completely different. When I run the following program a STRING TOO LONG ERROR IN 20 is detected, even when the string length is only one character long:

```
10 OPEN 1,1,0,"DATA"
20 INPUT #1,ME,SE,TL,CE,TL
30 CLOSE#1
```

This has puzzled me: the manual says the maximum string length is 255 characters.

And finally, can you tell me what the machine code instructions needed to find a random number?

The SYNTAX ERROR in a DATA statement is caused by trying to READ a character value into a numeric variable. The lines in your letter look all right but are you sure you haven't got a letter 'O' instead of a digit '0' somewhere? It is very easy to miss out one value in a string of DATA items, so that the READ statement comes to an alpha character while it is still looking for a numeric one.

The maximum length which can be assigned to a string is indeed 255 characters, but the maximum length which can be INPUT is only 80. If you are INPUTting several values with one INPUT statement,

each value in the record must be separated on the tape by a comma. A typical line to write this data would be

```
100 PRINT A5,"RS","CS
```

To produce a random number in assembly language use one of the following calls as necessary

```
JSR ED08 equivalent to RND(0)
```

```
JSR ED09 equivalent to RND(1)
```

```
JSR ED00 equivalent to RND(-1)
```

In each case the random number in the range 0 to 1 is left in normal floating point form from \$00 to \$FF

Dear Tommy, Could you please tell me if it is possible to get programs written on the Vic to run on the 64 if am considering upgrading to a 64 and I am wondering what I could adapt the programs I have written on the Vic without too much difficulty.

It all depends upon how you have written them. Basic programs should run without too much trouble (provided you have not filled them with PEEKs and POKEs) because the two Basics are identical. The major change here is to accommodate the fact that the 64 has a 40-column screen, so you will want to alter your screen displays to make them look nice with a different format.

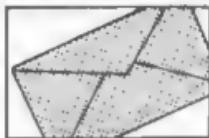
It is the PEEKs and POKEs which, as always, cause the problems. Fortunately Commodore have gone to some lengths to make your job as easy as possible here. POKEs into locations below 1024 are likely to be unchanged. The screen memory now starts at 1024, and the corresponding colour area is 15296.

The procedures for high-resolution graphics and sound have changed completely, though, so you will have to look up the articles in *Commodore User* dealing with those, but as the 64 is so much more powerful in these respects you would probably want to modify your programs anyway.

Letters

# Write away

**This is your page: normally we write for you, but here we listen. Feel free to let us know what you think - about the magazine, about Commodore, about suppliers, about life, art, the meaning of existence or whatever. We don't print everything we receive, of course; but anything that might be of specific relevance or general interest will make it to these pages.**



## About ANIK

In your February issue you carry an advertisement for Anik Microsystems Software, the ad says your games will be sent within 48 hours. I think you would like to know that in answer to a similar advertisement I ordered Yamaha on 10 October 1983 I see from my bank statement the cheque was cashed on 14 October.

As I did not receive the software I wrote to Anik in December but as yet have not received a reply. Since Christmas I have telephoned five times; three of the five times a youngster has answered and said someone would ring back - they never did. On the other two occasions a woman answered, the first time she said it would be attended to the following day - it wasn't. The next time she said she remembered passing on my message to Mr Andrews and she would tell him again.

It is now nearly five months and my letter and telephone calls have been ignored.

I think you should know that the advertisement your magazine is carrying only results in people losing money instead of receiving the goods they ordered.

R.R. Riste, 43 Easter Road, Kinsale, Co. Cork, Munster, Ireland, IV36 0FG

This is only one of a number of letters we've received about Anik. Reluctant to condemn anyone without giving the chance to respond, we have been trying to get in touch with this company by letter and phone for two months - with no effect.

We are not accepting any further advertisements from this company. We advise you not to send it any money. And

anyone who has lost money by ordering games from Anik is recommended to drop into a Citizens' Advice Bureau and ask about Small Claims in the County Court - a cheap and easy way of taking a defaulting supplier to litigation.

## Devaluation

I read with interest W.J. Howard's remarks concerning the devaluation of his Vic and your reply

I bought my Vic in January 1983 after reading your December 1982 article which had influenced me a great deal. I had felt then with the possibility of this (now mythical) offer I shouldn't lose much. I went on to buy all Vic expansion - including expansion board and printer - feeling that if a company was prepared to consider its customers they had a right to further support.

My naivete has been a little costly on my pocket and I now find that to try to sell entails almost giving it away. My decision is to hang on to it and save for a different make of machine I shall certainly not buy Commodore products again. Its sales tactics over the Vic have left much to be desired.

My attitude to your mag over this experience was also wary and when it became more and more high I began to groan and decided enough was enough; however this month's issue has restored my faith somewhat and I am digging into my well-worn pocket to see if I can find enough pennies to make up £12. I also find your mag invaluable for software addresses, as living outside the UK obtaining software is sometimes a bind.

Which brings me onto the re quest. Is it possible to review more useful software than the mindboggling games? Or better still, as well as I have at present the Home Office word processor which for us price is great value; however, I could do with something more sophisticated. I would also like a spreadsheet. I realise that what I am after are business applications; is there any hope for my little machine? (Should you have covered this last request my

apologies for while I was dithering on whether to reshow or not to reshow I missed several copies.)

Oh, just to round off, can anyone tell me why when using the Home Office with the 1525 printer does the whole shebang hang up on me on the second copy? It happens usually after making amendments to the master copy and justifying again.

Mrs V Yates, BIFPO

## Dear old USA

Being completely new to computing I rely heavily on reviews of games software before making a final choice for my 94. After trying various mags I have settled for buying *Commodore User* regularly, so could we please have more games reviews?

Now to the real reason I'm writing. Some software houses are advertising American games software. What is baffling me is why the games are so expensive. They range anything from £20 to £40 per cassette. Why? Is it because their games are far superior to our own British games or more complicated? How do you know what you are buying? Having not seen a review of any American game, I for one would never part with so much money to find out!

So could you please explain the reason behind such high pricing of games software from the USA?

M.J. Wiles, 192 Henlys Way, Coedwyr, Cwmbran, Gwent, South Wales NP44 7LB

Suppliers tend to attribute the price vagaries to import duties, the risk of buying large quantities at a time, and the uncertain exchange rate (if you order \$3,000 worth of something when you expect it'll cost you £2,000, and then the rate changes so that it'll cost you £2,800, it can make a big dent in your profit plans). But in general we agree - US games in Britain shouldn't be so expensive. After all, British software in the States isn't marked up proportionately.



## Simply good sense

I don't ask you to print this further correction to the review and subsequent comment on our *Simply Wine* program, and I don't want to upset a reviewer who will, we hope, review more of our products in time to come, but I do feel that your heading and Chris Durham's reply to my letter in the February issue imply that I am a lar. I am not happy about that.

Chris Durham - I noted a number of changes some of which are additional calls on the error checking "routine" is a contradiction of my letter and a blatant misstatement of fact. If you are going to allow your own staff to have the last word in such a manner then you have a responsibility to see that what they say is not derogatory or misleading. In fact, the only change made in the error checking in the correct version after the review was that an 'IF DN<-4 THEN', which had somehow been lost in the particular master used, was replaced **WITHIN** the error checking routine before a **RETURN**. I enclose a letter from one of our many satisfied customers which confirms that the error checking already existed in the program, and that he was surprised to see your misleading review.

While I applaud the editorial independence that keeps reviews and advertising distinct in the majority of British magazines, I do feel that it would be a good idea if you were to check your conclusions with the producers of the goods before publication. After all, quite apart from the relatively rare occasion such as this when a bad copy is received, it is a rapidly



changing market. Continual tweaks and improvements are made to software by companies trying to give their customers good value, and one frequently sees products stated for shortcomings which have already been put right, or for not having some feature which has been added since the review copies went out. Also, this lack of communication with the supplier regarding problems is quite uncharacteristic of the situation our users find themselves in, as borne out by the second customer's letter attached. I should add that this customer's problem is after some years of using our software, and has only arisen on his changing equipment.

Genius user reviews would also be a decided step in the right direction. We get very irritated by reviews of programs (not just our programs) in which the reviewer complains that the program does not have this or that nice feature found in some other program, or has only ten thousand variations instead of the ten thousand three hundred and seventy one of program X. Specialists seem to find it hard to understand that there are many users who want fewer features, not more, as long as they are the right features. All programs are based on a set of compromises, and few magazines take into account whether a program has been properly balanced for the group it is actually aimed at, or how satisfied actual users are. It is easy and mindless to go on adding new features to a program. Knowing where to stop before it gets too complicated for the ordinary user to enjoy using it is a grossly neglected part of the skill of programming.

The penchant for complexity and novelty in software is closely related to that attitude of mind that makes magazines treat the latest as the greatest, so that thousands of ignorant people rush out and buy a theoretically 'better' machine that has no software, no peripherals other than on paper, and no background of user expertise or documentation. Computing for some people is not a lot of gew-whizery, but a simple wish to get on with various jobs more efficiently.

Misleading reviews, whatever causes them, do not help the

product, they also hurt your magazine. Every user of Simply Write who reads your review knows that it does not properly describe the program he or she uses, and each will view with some lack of confidence your future reviews of other products. Every reader who did not know the program has been to some extent put off buying it, which means that our advertising in your magazine may achieve less over the year than the same amount spent in some other journal. We would not be so *crazed* as to threaten to withdraw our advertising, or even to want to do so after such a long and co-operative association but we cannot ignore comparison of returns when we are planning future outlay. We know also from correspondence on the subject that your review was directly responsible for our not receiving a re-order from a foreign company whose last order amounted to over £1,500, as well as anxious letters from other foreign distributors who have been happily and profitably selling our products for months past. We should have to be pretty thick-skinned not to feel upset about that.

**Brian Tregar, Simple Software Ltd, 15 Bavelock Road, Brighton, Sussex BN1 6GL**

## Systems of romance

Strange this feeling, as the computer age has heated up. It's a feeling that as an intricate part of life on this planet I have been given the right to own such power, lying at my very fingertips. Just under the keyboard lies a brain more complicated than most humans can comprehend.

Yet that power is only intrinsic, the real power remains in the biological organism of the computer which designed the close running companion the microprocessor, that of the human brain, a conglomeration of thinking power residing in the ultimate of man's tools, capable of guiding him even into deep space.

Now that I am part of this 'System of Thinking', I am bewildered at the way it has changed and is continuing to change the society we live in. I feel that every time I mention to friends and colleagues that we (wife and daughter excluded) have acquired one of those dark mysterious machines, their view of us changes. The usual comment being "Oh I don't understand those things, what do they do anyway?"

As we all know computers are like dumb waters, 'they can't do anything by themselves, without a

human operator putting in info' Knowing this takes away none of the awesomeness of the feeling of power I get every time I key in *re-lays* at the speed of light down microscopic channels to command centres ready to obey in the right sequence, of course.

For me Walt Disney's "Tint" was more than fantasy, I thought it was in every way analogous to the computer and operators that generated the major graphics animated into the movie. The computer and the human brain is a two-way communication system intersected at the keyboard. Feed back being generated audio/visually. Are we instructed by the m/c or are we instructing the m/c? Do we as in *Tint*, enter the computer through the screen, the keyboard being our passport?

Meeting the new challenge for me is fascinating. The new frontiers are now in sight, dialogue from both sides continues to be understood. The future, well who knows.

**R Stannard, 9 Burnley Hill Terrace, Stone Chair Shelf, Halifax HX3 7LQ, West Yorks.**

P.S. Sorry I haven't mentioned the mag or included any comments such as great type set, or keep us, the users, happy with more absorbing helpful information etc etc but rest assured as long as it, the mag, remains in the above state I'll keep buying it, ok.

## Endless manic miners

If there is anyone who has Software Project's Manic Miner on the 64 and is unable to get anywhere on three lives, here's the procedure to give unlimited lives.

Rewind the tape  
Type **VERIFY**  
**LOAD",1,1**  
**POKE 16573,834**  
**POKE 16572,234**  
**POKE 16571,234**  
**SYS 16384**

It was easy enough to work this out using the Mac64 Assembler Package from Commodore (which is excellent). Anyone wanting to convert programs to disk, here are four tips:

Find the start and end addresses of the program just loaded off tape with  
**?PEEK(178)-256 + PEEK(174)**  
(end)  
**?PEEK(194)-256 + PEEK(198)**  
(start)

Save with a suitable monitor. If program lives under the Basic ROM, switch it out using the monitor by

**A02ASSTX\$01**  
**A02ASBRE**  
**A02AC**  
**G02A7**

And then save it, re-load with **LOAD "name",8,1** Also try saving the tape buffer with **"name",26,033C,08PC** from your monitor.

I am starting a 64 division of a Spectrum club at Ormskirk school dinner hall, Wombourne, West Midlands on Mondays at about 7pm, if anyone is interested in the area. We will be at the Midland Computer Fair at the NEC.

**Nigel Wilcox, 58 Windsor Gardens, Castlecroft, Wolverhampton WV3 8LZ**

## Compiler controversy

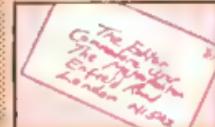
**roges on**

I'm not able to enter into the controversy over which 64 Basic compiler is the better, DTL or Peapack, since I only have experience of the former but I found Mr van Aardt's letter from South Africa most extraordinary.

We have been using the DTL 64 Basic computer in conjunction with our *Cash Traders' Bookkeeping System* since August - and can assure any of your readers who may have been worried by Mr Aardt's letter that (provided the 1541 disk drive is functioning correctly) the DTL compiler is trouble-free.

We find that our original program which is 31K bytes long is reduced to 21K bytes. We cannot offer meaningful speed figures because in the interpreted mode our program spends 90 per cent of its time in garbage collection. However the compiled version (the only version we sell) has an optional feature whereby the VAT and net value of a purchase invoice can be calculated automatically from the gross. When the operator presses key S, the results of the two calculations are displayed on the screen in the blink of an eyelid quite fast enough for most people.

**Arnold L. Shaw, Director, Quick-Cash Limited, 15 Neasid Crescent, London NW4**



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## DAMS modified

Re your article in **Commodore User** March '84 Shedding light on the 'mane' I should like to shed some light on the DAMS Pustnik.

Ever since the early days of the university mainframe demonstrations I have eagerly awaited the advent of an affordable light pen. When I saw the first advert for the Pustnik for my 64 I thought that my dreams had come true and duly sent off my money. When the box eventually arrived I read the manual, loaded the artis program and phugued in the pen.

Well, I was really impressed with the software but quite disappointed with the pen. My dream was shattered. When used with my Ferguson TX colour television (which I consider pretty good) the light pen's cursor seemed to fly everywhere especially to the right hand edge of the screen, and rarely where you pointed the thing.

I had a choice, do I ask for my money back? Or is there some design fault I can rectify? Now, sending it back would have meant more weeks without a light pen and so I decided to prise it open and have a look. DAMS claimed that the 64

Pustnik was greatly improved but the following obvious, simple cheap modification made it much better. (I find it hard to understand why DAMS could be so penny pinching and then blame the limitations of technology.)

**Modification number 1:** Strip off a half inch piece of black quarter inch diameter co-ax cable sheath. Push this tightly over the tip of the lightpen leaving an eighth of an inch projecting beyond the tip. This has several immediate advantages. Firstly you now have a soft plastic tip instead of the photo diode lens on the metal case. No worries about scratching your television screens any more, the black plastic acts as the blinder on a horse, making it look only where you point it. electro-magnetic charges

present on the TV screen do not now manage to discharge themselves into the metal case (thus preventing the cursor hiccup due to that), lastly, dust now gathers around the plastic rim and not the photodiode.

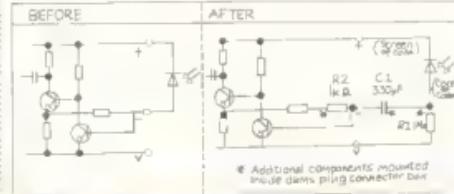
**Modification number 2:** It turned out that the rather inflexible flex is not screened against radio or electrostatic interference when more than half of the flex was adjacent to the TV screen the cursor would not respond. As it happens, the flex is actually three wires of which only two are used. If one end of the wire which has been cut back is connected to the terminal marked V on the DAMS PCB, the extra screening effect of this gives a two-fold improvement allowing more of the flex to be

closer to the screen without causing problems. And a complete cure to this interference problem can be achieved by replacing the co-ax flex altogether with standard microphone co-ax cable. When this is done the extra cable length also enables much more freedom of movement. I am using six feet of 2.5mm sheath diameter audio microphone cable.

**Modification number 3:** Look at figure 2: capacitor C1 and resistor R1, now AC-couple the photodiode and transistor stages. This enables correct operation in a much larger range of ambient lighting conditions and removes the need for a dark screen border. The brightness control of the television set does now not have to be adjusted very critically, and local variations in screen brightness levels are in the main compensated for.

**Modification number 4:** The inclusion of resistor R2 in series with the existing resistor on the base of the input transistor increases the gain of the circuit, the result being that the pen works on most screen colours except dark red and large areas of black.

D.R. Donnelly, 24 Forstera Close, Daventry, Stockport, Cheshire SK3 8RU





# COMMODORE 64

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**Compute à Frap.** Want French periodicals (age 11-15) interested in Commodore computing to exchange programs etc? Contact: The French Connection Section: Patomagique College, Pierre Dubois, 71 Rue Victor Boissel, 53017 Laval, France

**Wanted: a penpal to swap ideas with.** I'm only an intermediate programmer. Please answer this advertisement and write to: Antonio Cataldo, 2 Yeovil Court, Mugrave, Victoria, Australia, 3170.

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**Wordcraft Word Processor** for Vic-20 cartridges also contains 8K Usable RAM only £50. Phone: Wakefield 262571.

**Stack storeboard with 8K RAM** fitted, Super Expander cartridge and Sargon II chess cartridge £45. Phone: (0924) 473037 after 6pm.

**40 column screen converter** for the Vic-20 cassette by AcuLogic Inc. £6. Centronics Interface and cable for Vic, enabling use of parallel printer. £15. Phone after 7pm: Stoke-on-Trent (0782) 641029.

**CB Basic cartridge** £40.00. Unwanted present. Ring: Blackpool 62277 Flann, 40 Burnsfield Avenue, Blackpool FY4 4AF.

**Vic software sale**, Gridrunner £3.25, Star Defence £4.75, Martian Raider £3.50, Guest of Mercavil £4.75, Star Warp II £2.50, Frogrun £3.50. Originals Mr M Taylor, 16 Gleeson Drive, Orpington, Kent.

**Vic-20 software (will separate)** Super Expander, Home Office, Skrambles, Chess, Jetpac, Helgate, Myriad Nightmare, Hippit. Price negotiable. Tel: (01639) 33062.

**Vic-20 4 slot motherboard +** 16K Rampack + Super Expander + Program Aid + Light Pen. £100.00. Alan 01-391 5043.

**Wanted: penpal for Vic-20 user** Swap tips etc. Age 16, name Karen Joine Guffy, 4 Long End Road, Burnage, Manchester 19. TWA.

**Simons Basic for CBM64** 114 new commands. In cartridge format. For details on: Guildford (0483) 233201 any time, only £2.99.

**Vic-20 software to sell** (£4 per tape) or swap. 20 great titles. See list for 5 Wills, 12 Lansdowne Road, Chatham, Kent.

**Natural health centre** urgently requires programs relative to natural therapies (eg. biorhythms, astrology, homeopathy, herbalism, aromatherapy, etc.) Please telephone Geoffrey Kaye at: 0908 670391.

**Wanted urgently: Commodore 1520 printer** platter manual to buy or copy. Willing to pay £10. Padgate 818189 after 6pm. Please ask for Joe.

**Commodore 64 penpal out there** age 14-16, with a view on swapping ideas and knowledge etc. Name: D Rossiter Address: Barn Cottage, Middle Biagdon Lane, Paignton, Devon TQ3 3YE.

**Vic software for sale due to purchase of 64** Various games £6 to £6. Also Programmer's Aid £15. Phone: Guildford 339965.

**Programs for CBM64 on disk** send me your prg lists. I'll send mine in return (have over 500 prgs) Øvend Amlein, Finstadgården 97, N-1475 Finstadgård, Norway.

**Wanted: English software** suppliers willing to ship 64 software to America. Send list/ catalogue to Samuel Lubell, 56 Meadow Road, Birrcliffe Manor, New York 10510, USA.

**Toddlers/ play with your parents!** CBM64 Animated, musical flashback and spelling program, developed in conjunction with school. Suitable 1½ - 7 years. Cassette £4.50, disk £7.00 from Toddlesoft, 1 Cat Lane Cottage, Ewelme, Oxon OX9 6HX.

**Wanted: Jelly Monsters** cartridge will swap for Avenger cartridge and chess cartridge or two tape software cassettes. Contact: Irahtron on 01-241 0370 London, Hackney.

**Trade CBM64 programs** with Ric Kube McCullion Street, Walkerine, SA 5330, Australia. Please send list.

**Arrowspeed cartridge for** Commodore 64, very fast save and load of off tape programs plus other functions. Two months old, only £36. Medford, 7 Thorn Grove, Hale, Altringham, Cheshire WA15 9AW.

**Swap Imagine's BeWitched** cassette (any Vic 20) for any other Imagine cassette. Tel: 0670 743662 after 6pm.

I have a very original idea for a computer game, but I haven't the skill or time to write it. Any offers? N Tregenza, 1 Gulyin Hill, Rekubbus, Penzance, Cornwall.

**Wanted someone who** swaps programs for the Vic 20 or to buy games. Many titles including arcade. Paul Woolson, 6 Kilmeadow, Breffin, Peterborough, Tel: 269736.

**Swap complete set of golf** club, bag, trolley, umbrella etc for Commodore printer or compatible printer for CBM64. Ring: Letchworth 6854 Beardsley 11 Jorden, Letchworth, Herts SG6 2NP.

**Commodore 64 plus** C2N cassette, introduction to Basic and Spartenman £19. Abingdon 31871.

**Wanted Commodore 64** disk drive and printer in good working order. Can collect locally. M Walton 70 Maple Crescent, Newbury, Berks.

**Vic-20 16K RAM**, Programmer's Reference, C64, Bites, Flight 0-1, Games, Some Vic magazines £7.50 Tel: Rustington 75669, Keeble 10 The Framptons, East Preston, West Sussex.

**Trader for Vic + 16K** original in good condition. Booklet included. Send £10 or consider exchange for cartridge (please specify). Phone: 0604 39779 after 6pm.

**Vic-20 software for sale** Cassettes £3, cartridges £5. Many top titles. 16K memory £10. Send tape for 1st. Martin Webb, 30 Helix Street, Melbrough, South Yorks S64 9PF.

**CBM 64 software** Spartenman, Maths (6C64) and Music Computer £25 each or swap. 0199 3712, ask for Barry.

**If your age** is greater than ten but less than 14 and you have a Vic-20 micro listen - if you are bored with your Vic games and want a penpal to exchange software with contact J Watson, 6 Redwood Glen, Chapeltown, Sheffield S30 4EA or phone 0742 (if outside Sheffield) 463565 after 4pm.

**CBM64 copier and header reader** will backup large proportion of cassette based software onto tape and disk. Available on disk £8 or tape £6. Cheques/PO to: Simon Hams, Box 011.

**Any Commodore 64 users** overseas who want to swap information and software. I have games and magazines from America. Send to: Ray Lew, 126 Merton Street, Ebwood 3184, Victoria, Australia.

**Future Finance business** software on disk. Unwanted and unused gift £34 including postage. Phone: Lancaster 47579.

**Vic-20 + cassette** + over £130 software books games. Postage All for £160 o.n.o. Bill 2 Winchester Road, Bexleyheath, Kent. 01 304 4741.

**64 utilities and games** to swap disk or tape. Many titles. Tel 0227 27783 evenings or weekends. A. Stafford T44, Carmarthen Road, Lincoln. 01 518 154.

**Commodore 3032, dual disks** Arcraft, Simplicity games, books, joystick, printer interface. Bargain £475. Also selling programs for C64. Easyprint. High Ryer T1 David, Hornchurch, Essex. 01 55733.

**Vic-20 plus 8K RAM pack**, 7 arcade cartridge games, book of games, Part 1 Basic course for cassette deck. £120 the lot. Alan 6 Station Cottages, Hitchin Herts SG4 8RN.

**Vic-20 software for sale** Defender Panic, Bewitched, Mini Kong, Wizard and Princess. All originals from Bubble Bus, Bug Byte, Imagine, Anarog, Melbourne House. Sale to: 73 North Road, Augersburn, Manchester M34 9JZ.

**C64 64 copier** plus header reader program. Make backup copies of your favourite software. On tape only. Instructions in program. £5. R. Stone 044, Cwmannan Road, Glanamman, Ammanford, Dyfed. S. Wales.

**Sales and swaps** for unexpanded Vic. Cassettes and cartridges including Avantgarde, Arcadia, All offers considered. Phone: Rupert on 021 454 0234, Monday to Friday 4.30pm to 7pm.

**Vic-20 games, Arcadia**, Space Invaders, Space Rescue, Catch, Snatch, Gold Rush, Wizard and Princess. All for unexpanded Vic, and cost only £5 each. All originals. D.5 Nash 43 Hempricot Road, Timperley, Altrincham, Cheshire WA15 7JG. Tel 061 980 5232.

**C64 3020 model 32K memory** Vic £240. Only 2 years old, hardly ever used. Phone: 01 2195 2185 (buyer collects).

**64 software club**: all Commodore 64 users who are interested in obtaining quality software. Software should: Ian Club 64, 85 Upper Drumcondra Road, Dublin 9, Ira 1.

**15 year old boy wanting girl** friend. Would prefer any girl who knows any amount of programming on the Vic-20. Gary J. Hattress, 9 Levenshore Avenue, Bradford 8, West Yorks.

**Penpal for inexperienced** sixteen year old. Can come from anywhere in the country. My address is Alison Muir, 22 Glen Ogilvie St, Leondale East Kilbride, Glasgow, Scotland G74 3SY.

**Romik Multisound Synthesiser** for unexp Vic 20. Price - only £4.50. Telephone: Broughton, 812619 and ask for Colin.

**Vic-20, Vixen 14K, But Plut** Sargon II Chess, Jiffy Monsters, Motherboard Reference Guide, Dr Winchon and dozens of cassette games. All boxed. £160. Colin Lennan, 16 Hutton Street, Sunderland SR4 7HB. Tel 0783 79098.

**Needed 1 Vic-20 or** Commodore 64 for a company to be used as a normal computer and a home computer. If you have one for sale ring Peter 22870 (name sheet).

**Intro to Basic 1 £10** one barely used. The Count Adventure, 55 Alien Blitz 50 or set £18. Contact Jackie M. Latyre, 1 Lever Park, Portstewart, Co Londonderry, N. Ireland. (Vic 20).

**Help needed desperately**. Lady losing her hair out needs help to solve adventure game, Tomb of Xeoxis, Greta Holiday 14, Hazelhurst Drive, Cheddleton nr Leek, Staffordshire. Tel 0383 351100.

**14 year old boy** would like penpal to swap tips for Vic-20 + some computer. Write to: Dominic Forsey, 2 The Padlock, Denchthorpe, Buxton HP17 8AG.

**Vic-20 Super Expander** £20. Also Sargon Chess £8, or both for £26. Brian Thompson 19, Redcar Road, Abbey Hey, Gorton, Manchester M18 8RD.

**Datasette unit model C2N** unused boxed. Surplus to requirements £25. Phone: 01 51 Albans 54119 evenings.

**Wanted 1515 printer manual** Need help Vic 20 basic programming? If you're stuck maybe I can help. Hints and ideas exchanged. Contact Terry Rutherford, 14 Weston Avenue, Leigh-on-Sea, Essex, SS9 8QY.

**Commodore 64 listings**: send your tape or disk with large size one £12.00 for fast return to: J. Ratsey-Woodruff, The Reflect, Yarmouth 10W, PC41 0XW. Large amount of software to swap!

**Unwanted Commodore games** given as a birthday present, want to sell Krazy Kong, Arcadia, Simplicity 64, and Anniversary. All new, want £20. Originally sold for £25. Please write to: Hitesh Shah, 53 Toffenhill Road, Palmers Green, London N13 6HY. Will consider selling separately.

**C64 disk drive** and printer dust cover, disk box, 20 disks, paper, 5 games + cassette interface + 8C Basic: Advanced Programmer's Guide £45.00. Phone: 01 515 6202 after 7pm. Peter Shires.

**My complete computer system** for sale includes: Commodore 64 cassette unit, 1541 disk drive, 1520 printer, joystick, desk joystick, game, manuals, magazines, Hoggle, around £245. Please ring Tadley (0755) 4579.

**Wanted to form** or join CBM4 users club, Castle Point, Essex. Phone: Ian on Canvey Island 682719.

**Vic-20 for sale**: Avenger £4, Arcadia £5, Andes Attack £3.50. Wanted: Audiogenic's Faith, Compute's First Book of Vic, Epyx's Crush, Crumble and Chomp, and Atarisoft's Defender. Phone now 0558 822509.

**Vic speech synthesiser** for sale. Cost £49.95. Will sell for £20.00. Wanted: vic Datasette recorder. Will buy or swap for speech synthesiser. Phone Richard on Welwyn Garden City 28587.

**C64 International Software** Exchange. Send your software list to: German user group, Bischwieg 3a, 6990 Wiesbaden, FRG.

**Vic-20 16K, Super Expander** Intro to Basic 1, £10.00 software will consider splitting. Telephone Athertonline 3017.

**Vic-20 cartridges**. Programmer's Aid speech synthesiser built from Maplin Talk Back - working £20 each or both for £35. Phone: 021 3536083.

**Vic-20 games for sale** Munchman £4.50, Metagalactic Llamas £5, will swap for other games. Gary Turner 19 The Parks, Sunridge Grove, Shrewsbury SY1 4JU. Tel (0743) 61997.

**Vic-20 for sale**, boxed, with C2N cassette recorder, 16K RAM pack, Programmer's Reference Guide and a selection of games £75. For quick sale. Tel (0734) 785690 after 5pm.

**Ation seven slot** expansion unit for Vic (switched) plus 8K. Super Expander, Prog 100, WII separate, 35 Alter Close, Heaton Le Hole, Tyne & Wear. Tel 0783 262140.

**Vic-20 user wants teenage** penpal for exchange of games, ideas, etc. Preferably from southern England. Contact Tim (01763) 6 Wootton Close, Normandy, nr Bourne, Lincs PE10 6WQ. (Age 13).

**Vic-20 + 32K RAMpack + Gorf** cartridge and three other games worth £180. Sell for £140. Address Howthwaite, Palms Hill, Wem, Salop. Tel (0939) 32810.

**Irish Vic owner** interested in contacting other Lancashire to swap games, tips etc. through post. Write to: Fergal M. Gaff 27 Sycamore Road, Finglas, Dublin 11.

**Disabled 64 beginner** would like to join a computers club. Stoke on Trent area. Fred Bates, 27 Chilton Street, Heron Cross, Fenton, Stoke on Trent, Staffs. Tel 0782 323524.

**Wacky Walkers** for the unexpanded Vic 20 for sale £5. Also Metagalactic Llamas. Price at the Edge of Time £5. Telephone: Brownhills 375836.

**Vic-20 complete starter pack** and two cartridge games, books and several cassette games to choose from. £50. Perfect condition £120.00. Telephone 0942 812489.

**Vic-20 C2N cassette** 1540 disk, 1525 printer. Programmer's Aid Super Expander, 16K RAM software on disk and tape + mags. As new. £400.00 o.n.o. Tel Stevenage 350308.



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